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POLLEN

Tiny but vicious public enemies

By NATHAN C. JOHNSON

ACCORDING to the Bible, Little David slew Big Goliath with a sling, even though Goliath was perhaps four times as big as David and better armed. Apparently it was a "clean kill"—a stone in the center of the forehead and no suffering.

Tiny pollens, about 1/230,000 as big as a human being, do not kill, but they torture those who are sensitive to them. One torture they cause is partial and prolonged suffocation. This suffocation is known to be brought about by the poisons from breathed-in pollen entering the body through the mucous tissue of the nose and then setting up a series of afflictions that give no rest to their victim, day or night, during each victim's particular "hay fever season," which may last for weeks.

In the May issue of Nature Magazine Nathan C. Johnson wrote about his studies of poison ivy, presenting some interesting and important information about its habits. This brought much response from our readers. In subsequent correspondence Mr. Johnson mentioned studies he has been making of pollens and some surprising things discovered. We asked him to write about this and here is the story of his researches up to November of 1935.

It is known beyond doubt that "hay fever" does not come from hay alone, but that it comes from pollen of one kind or another given off by the blossoms of trees, weeds, grasses, flowers and other plants in wide variety as they mature; and that these pollens are carried by the air we breathe. Since some people are sensitive to one pollen but not to others, and since other people are sensitive to more than one variety of pollen, it follows that "the Season" for different people varies according to the blossoming-time of their particular plant enemy.

Partial suffocation from "hay fever," however, is not the only torture that pollens are capable of inflicting. As further aftermaths of pollen poisonings come asthmas and some eczemas. In fact, some authorities now believe that the "common cold"—humanity's most widespread plague—owes its occurrence and characteristics in some measure at least to this same phenomenon of pollen poisoning through mucous tissues. The assembled economic cost chargeable to pollens-out-of-place is staggering in amount each year.

Many men have spent their best years in studying pollen. A vast amount of information has been obtained. Yet, so far as is known, no direct attempt has heretofore been made to find out how breathed-in pollens act *in the nose,* so that a direct attack may be made on them to end, or, at least, to lessen their vicious activities. This brief article, then, is an outline of such an attempt, together with a few of the findings resulting from the research.

The essence of the problem is: How do pollens act *in the nose?* To get at the root of this problem, many factors and many things have to be considered. Since the behavior of pollen in the nose has, until recently, been a thing guessed at but unknown, the first step is rigidly to exclude all guesses and to obtain at least some little accurate knowledge as a starting point. With new and accurate knowledge, however little, thus gained, surmises and reasoning have to be indulged for a time, then proved correct or incorrect to reasonable satisfaction. And then, and not least, many thousands of trials and tests have to be made and closely observed before there can be any degree of solution of the problem.

So, with the objective thus outlined, the campaign of investigation calls for as necessities: (1) Some of the almost infinitely-small pollen-particles, or grains. These

are obtainable out of the air, any place and any time; (2) a microscope of highest grade to make these tiny pollens visible; (3) various kinds of light—amber, daylight, blue, red, ultra-violet and infra-red, or "black light," with which to search the pollens for their secrets; (4) a knowledge of bio-chemistry and bacteriology and a full equipment necessary for such work; (5) books on what other people have done; (6) some patient collaborators, preferably those who do not know too much and are willing to learn; (7) infinite patience on everybody's part with "do it all over" a rallying-cry; (8) and, not least, much faith that the outcome will be fruitful, for all of this is gruelling work that pulls the eyes out by the roots, upsets the digestion and makes days and nights such a fair replica of a little Hades that faith alone can sustain anyone through the ordeal.

At the very outset the fact confronts one that there are hundreds on hundreds of different pollens, some relatively large, others small. But as the work of other men has reduced the known poisonous ones to some thirty in number, one great simplification is possible at the very beginning, for only the poisonous pollens are of interest.

Another great simplification is the knowledge, also obtained from the work of other men, that the lining of the nose, post-nasal passages and throat of human beings is a soft, yet resistant, kind of tissue known as "mucous tissue"; and that this tissue is rather vast in area, perhaps twenty square feet per adult, counting its folds and its subdivisions. And it is further known that this tissue, when in good shape, can resist unbelievable onslaughts from enemies, such as the millions on millions of germs breathed in every hour of the day and night. On the other hand, it is known that if this mucous tissue is not in good shape for some reason or for any reason, the causes of some of the most acute sufferings known can enter the inner body through it; and that once they are in, they will go as fast as possible about their diabolic work of producing distress, disease and perhaps death itself.

Infantile paralysis (Poliomyelitis), to take an extreme instance, is asserted to enter the body through the nasal mucosa. For those who enjoy speculation as such, it may be noted at this point that the height of the "polio" season and the height of the fall pollen season are coincident. But speculation such as this has no place, unless it can be proven true.

So, putting speculation aside and reasoning now from the known to the unknown, consider the human skin—that marvellous surface of about thirty square feet area per adult, which every hour and every day so perfectly protects our inward body and its delicate organs from the onslaughts of billions on billions of germs.

This protection is almost absolute, *unless there is a break or lesion in its surface.* A scratch, for instance, is a lesion, even though it does not draw blood. A pin-prick may be a dangerous lesion; and it has been learned by painful experience that when such things occur, it is wise to assist Nature a little by applying an approved antiseptic to the lesion as quickly as possible.

Beyond that, all must rely on Nature. As Ambroise Paré, a remarkable surgeon of mediæval France wrote truthfully and humbly in 1539: "I dressed his wounds; and God healed him." "God healed him!" That one principle, and exactly as stated by Paré so long ago, is acknowledged, despite all the mystifying and often argumentative knowledge of our modern professionals, to be of dominant truth today.

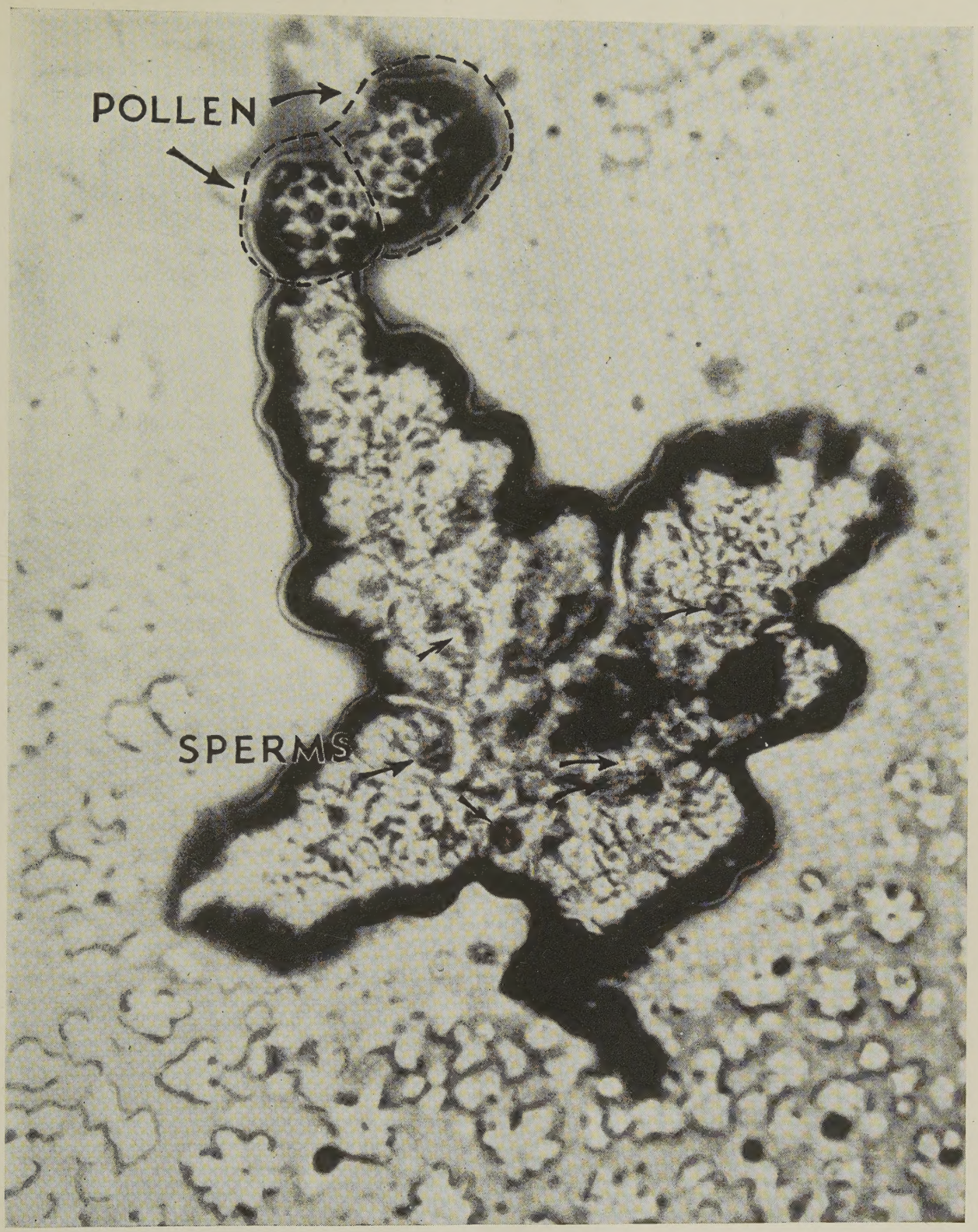
This consideration of the skin and lesions and wounds and the God-directed forces constantly at work for the preservation of our human welfare is not, as might momentarily be thought, a digression from the study of how a tiny pollen can lay low the relatively huge human body. It is, on the contrary, in direct line, for if it is recognized that on the skin a lesion or break is necessary to admit the hostile forces, it is equally fair to assume that the same holds true for the mucous membrane, provided we can prove by further study how a pollen might and possibly does produce a lesion in these membranes.

Of course, it is difficult, if not impossible, to see or to study the behavior of a tiny pollen in the lush and velvety growth of the mucous lining of the human nose. Everything is against it. We can, however, simulate outside the nose what may occur in the nose, and possibly show pretty closely in these artificial surroundings what does occur in the nose. When we have done that, we possibly may further devise means for preventing this observed behavior of pollens outside the nose, and then we possibly may put this preventive means in such harmless and agreeable form that its use can be transferred from the laboratory and its glassware to actual and beneficial use in the human nose.

So, taking known conditions: There exists in the human nose: (a) a soft bed of tissue at about 75° to 95° F. of temperature; (b) plenty of moisture and (c) plenty of protein, or living tissue-matter. Surrounding pollen with these substances and conditions, and observing their behavior at intervals should give at least an indication of what a pollen does in the nose.

As further facts known, there should also be listed: (d) a pollen is a tiny sac, having a tough outside, sometimes covered with spikes like a chestnut-bur or a gum-ball, sometimes as bald as a door-knob and carrying within it the male sperms of its parent plant; (e) it is a living thing, created for the one purpose of procreating its own species by finding its way (on the winds or by insects) to the ova-sac of a flower and (f) when it does so locate itself its contained sperms are in some manner liberated, so that sperm and ovum unite to form a new plant by their union. The fierce determination of these life units to carry out their appointed functions is attested on every hand and under the most adverse conditions throughout all natural life.

To make short a long story of a long search, all the foregoing known conditions are correct and correctly stated, but one necessary thing has thus far been omitted. This thing is a *hormone,* without which there will be no artificial growth of pollen in the laboratory. But as such a hormone is supplied by living human tissue almost as well as by a flower, an endeavor by pollen to consummate



Discharge from cultured ragweed pollen. The irregularly-shaped body with dark outlines coming out of one pollen and occupying most of the photograph is a typical "jelly-mass" emitted by these pollens when cultured. This jelly carries the sperms, as shown. If this mass is mentally pictured as entering the mucous tissue through a hook-made lesion, then "hay fever" loses its mystery and becomes comprehensible as a hypodermic injection of irritant and poisonous substances given off by the pollens themselves. Magnification is 2300 diameters. The excellence of these photographs is due in large measure to the perfection of microscope and microscope lenses loaned to the author for this highly specialized work by the Spencer Lens Company.

their appointed end under these complete conditions, whether wholly natural or partly artificial, may be expected to occur in the nose, for it also can be consummated in laboratory glassware, once all these duplicate essentials are assembled. And all that is easy, once the little secret is known.

There is another little secret that cost many headaches to find out. That secret is that only fresh and virile pollens can be cultured in the nose, or in glass, or in flowers. Such pollens are those newly-liberated by the flower; and apparently this virility is held at its prime for only a month or so after this liberation. Old and senile pollens do not cultivate or procreate—one of Nature's beautiful and rational provisions for the continuance of all species at highest perfection. As might be expected, this early senility of pollen as observed accounts logically for the abrupt ending of the several "hay fever" seasons that arrive quickly and almost as quickly die away in intensity as one variety of plant after another comes into flower. It is true that there is always some aftermath or overlap of such seasons, but that may be due to virile pollens from afar, where flowering times are different, being blown about and breathed in. Prepared plates catch virile pollens of all kinds the year around, so such overlapping of seasons may be expected. Cold does not affect pollens, as has been supposed.

So, again, in quick outline and recapitulation: pollens fly the year around; only fresh or virile pollens can be cultivated in conditions simulating conditions in the nose; old or senile pollens (from which immunizing extracts for injection are often made) do not so cultivate; and the juices in or juices of only some thirty-odd of the various hundreds of varieties of pollen are known to be poisonous; and that even these are not harmful unless they can get into the human system by some means, such as a lesion in the mucous membranes.

So, the next question becomes: How can a pollen make a lesion? The photographs attendant on this article indicate that they can and probably do make such lesions by their living actions and movements. These photographs are of ragweed pollen—a tiny thing between 1/2500 and 1/3000 part of an inch in diameter. The ragweed is chief among the great trouble-makers in the world. Cultured in moisture, protein and a hormone at almost any temperature from 50° F. to 110° F., it will perform as the photographs show, and this has been repeated time after time and always with substantially the same results.

So far, so good; and the gods have apparently been kind in giving out some knowledge. But the really important question is: Can the ragweed pollen and other pollens be prevented from going through their life-cycle as shown, and thus be prevented from making lesions and spilling their poisons into the human system? Happily, the answer now seems to be "yes". It should logically follow that if this life-cycle can be stopped where it would do harm, then pollen tortures may be ameliorated, if not stopped.

But in conclusion, a word of caution is necessary. No pretense is made of presenting in this brief article a finished thesis. It is a summary only of progress made up to last year and an outline of means used. But, by its brevity, it may serve to stimulate others to more and to better work until the problem is completely solved. Let it be hoped that this may happen, for the field is wide and open to all who will earnestly search for that which may now be needful for absolute success.

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The Lyrebird

By EDITH M. LAING

This is the first of a group of articles dealing with birds and mammals that appear on postage stamps

CELEBRATED for its many strange and eccentric creatures, the island continent of Australia is perhaps most noted for its lyrebird, *Menura superba.* This extraordinary bird is pictured on the accompanying one-shilling stamp of the country, enlarged to show the detail of the plumage.

The first white men to catch a glimpse of this exceedingly shy bird were filled with amazement. Their enthusiastic reports sent eager naturalists pell-mell to see the wonder for themselves, and great were the hardships they went through to secure specimens. Usually they were successful only when they employed the native blackfellows, expert in noiseless tracking.

The male lyrebird is renowned for his tail which, when erected in its full glory, resembles a lyre. The birds live in pairs, and it is for the delight of his mate that the male dons the sixteen glorious feathers during the nesting season. In his mating display the bird is completely concealed by his beautiful mass of filmy plumes.

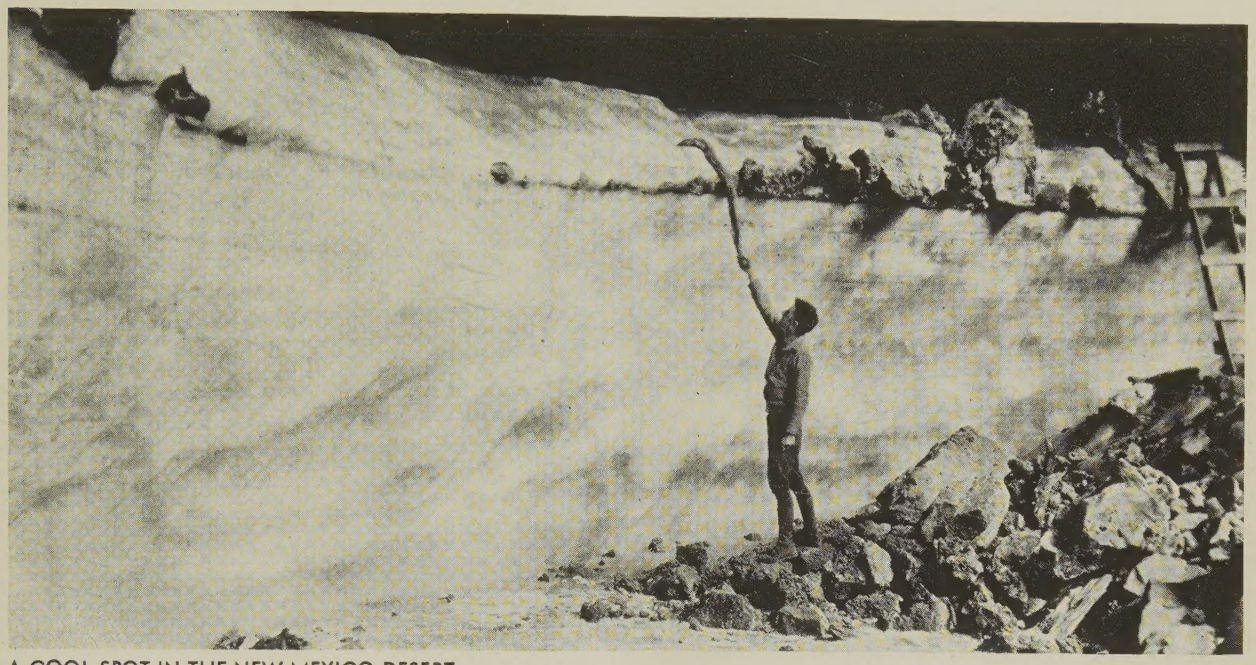
The body plumage is a rich brown above, and grayish tinged with red beneath. Not content with his own song of sweet, liquid notes, the bird is a great mimic, and loves to imitate the songs of other birds. The dome-shaped nest is built up of sticks, leaves and moss, and warmly lined with down. Settlers in the bush sections are glad to have lyrebirds around, for their diet of insects includes pestiferous beetles and centipedes. Thus its beauty is combined with an economic value.

Strange Sights in New Mexico

Ice in the desert; iris and sagebrush side by side; rock inscriptions antedating the voyage of the Mayflower

By HUGH STEVENS BELL

Photographs by the Author



A COOL SPOT IN THE NEW MEXICO DESERT

A wall of jade green ice ten feet high and forty feet wide formed in a cave in New Mexico. A welcome sight to the weary traveller who has tramped under a burning sun in a temperature of 100 degrees

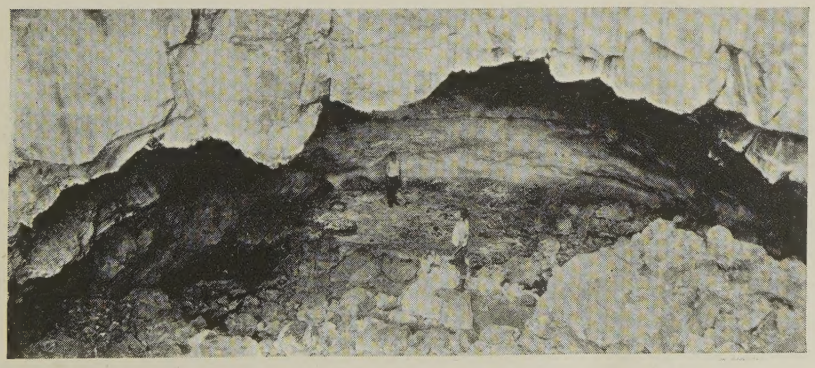
ANY MAN who started into a non-mountainous part of our southwestern country on a sweltering June or July day to look for a few tons of natural ice would certainly seem to be a fit subject for an alienist. If that man returned to tell you that he not only found hundreds of tons of ice and icicles forming during the midday heat, but had also killed a rattlesnake in a clump of iris growing on a sagebrush flat; growing, in fact, in the shade of the sage—if all this happened you probably would consider yourself competent to pass upon his mental condition without the aid of an alienist.

Now if you happen to be a bit rusty on the fine points of American history—as the majority of us are—when that supposedly demented individual has the poor taste to tell you that he also found a sandstone cliff upon which was carved an inscription bearing the date 1606, you will probably make every effort to retire to a safe distance.

Few there are who would blame you for that. Even a fool knows that the desert is no place to go for ice, and most of us have a habit of thinking that the history of our part of North America began when Plymouth Rock obligingly served as a stepping stone some fourteen years after the carving of that inscription.

Of course there is nothing anomalous about rattlers and sage, or rattlers and iris, for that matter; but for anyone to ask you to believe that an avowedly wet plant like the wild iris could live in peace and harmony with such an enthusiastic dry as the sage. Preposterous!

Yet a little tour of sixty miles from Grant to El Morro in the state of New Mexico should be sufficient to convince the most skeptical that our obviously crazy man is not only perfectly sane



A VIEW OF THE ICE CAVE FROM THE SURFACE

The pit is 200 yards long, one-third as wide and about 75 feet deep

but scrupulously honest, at least as concerns this cave.

No one can tour in the state of New York in late June or early July and keep his eyes open without being thrilled by the millions of blue iris plants that fairly wage war upon each other for standing room in almost every boggy place. To be sure there are spots in Herkimer County where blue haze gives way to yellow mist as the European iris routs its American brother. But ever and always the wild iris wants to keep its toes in the water in New York.

Therefore, if you've toured the East, you may be surprised as your car twists its tortuous way across a sagebrush flat about twenty-five miles southwest of Grant, N. M., to find yourself surrounded by thousands of plants of the lovely blue *Iris missouriensis*. Except for the presence of sage and the conspicuous absence of moisture one might easily imagine himself in some eastern state in iris time. The rattlers fit fairly well into either picture, although they are probably more abundant and certainly less feared in the Southwest.

ANOTHER NEW MEXICO FREAK

Beautiful *Iris missouriensis* growing in the shadow of a scrubby sage

A few miles beyond the iris-sage flat the road skirts the edge of a large lava flow and here it is necessary to abandon the luxuries of the car to follow a fairly distinct trail for nearly half a mile across the *malpais*, or bad rock, as they call it in the Southwest. It is a wild, dry waste.

Swifts and horned toads dart away to the safety of their crannies, or stop with all four brakes to survey you after a breathless run of four or five yards. A rattler buzzes a gentlemanly warning before he glides into one of the innumerable cracks that offer him sanctuary. A variety of pretty little flowers go pioneering wherever a spoonful of soil has managed to accumulate, and on every hand gnarled cedars distort themselves and fairly writhe in the agony of wresting their sustenance from an unwilling and niggardly earth.

Without warning you find yourself suddenly upon the edge of a great pit, two hundred yards long, a third that wide, and perhaps seventy-five feet deep. The roof of an old cave beneath the lava has fallen and the earth seems to have opened a gaping mouth to swallow everything that might come that way. It is not a pleasant place.

By ladder it is an easy matter to descend to the floor of the pit and then choose a route over the unbelievably rough "tongue" as you go back into a huge throat down which you pick your perspiring way for another forty or fifty feet to find a wall of jade green ice presenting a façade more than ten feet high and four times as broad.

Since the mouth of the cave is wide open it is sufficiently light to make motion pictures without the use of flares, and as you look out into full daylight and a temperature of 115° or 120° F. in the blazing sun, it is quite possible that your view may be slightly obscured by the icicles that are forming like pointed uvulas in that icy throat. In an instant you have passed from infernal heat to eternal ice and you long for the shirt you abandoned so willingly back among the distorted cedars and think how nice a sheepskin would feel. And think of it! You are on no towering summit. Neither are you in the far north, nor is it winter. It is mid-summer, perhaps, and you are in hot and arid New Mexico.

You may warm up a bit by sliding vigorously on a patch of glare ice that has formed at the foot of the frozen wall, or if you have a desire for adventure you can scale the frosty façade and explore the bowels of the earth with ice underfoot and jagged lava lying in wait overhead. If that is too tame just slide down a tunnel that leads through the crystalline floor into what seems to be eternal cold and darkness.

That the ice should have a sulphurous taste is not the least surprising for the water from which it is formed

A ROCK EL MORRO INSCRIPTION

A Spanish conquistador left this record of his successful endeavor to subject the Zuni Indians, whose village still exists today

seeps through many layers of lava before reaching the cave, and, as you know, sulphur, lava and volcanoes formed an early triumvirate in the ancient history of this world of ours.

Just why the ice should persist throughout the year in this region, which is not particularly cold even in winter, is a question we shall not attempt to answer. It is there, and that is sufficient for the present. Similar caves harbor eternal ice in a number of other districts in Arizona and New Mexico, and in some instances the reasons are quite obvious. In this case they are not.

Geologists often refer to these lava caves as tunnels or flues. They are formed when the surface of a great lava flow becomes hard while the lower portion remains molten and simply flows out from beneath the crust leaving it high and dry, much as a brook may dry up beneath a layer of ice that formed upon it at high water.

Even a hurried examination of the tunnel's mouth will reveal the fact that once the flue was formed many other eruptions occurred and sent down successive layers of molten rock which, in some cases, became far too great a burden for the crusty roof to bear, and it crashed into the tunnel to form such great pits as the one already mentioned.

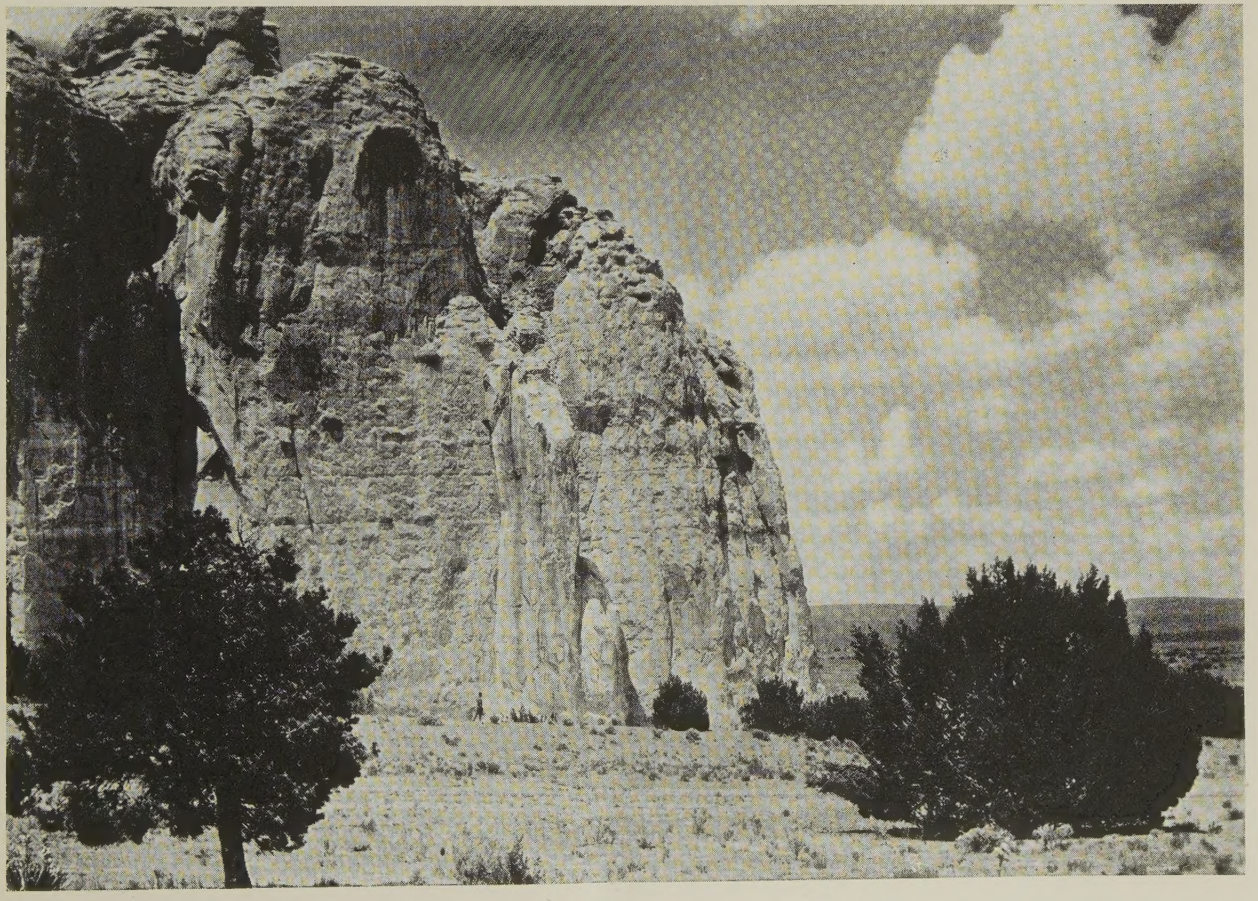
Molten lava is full of gases that bubble to the surface much as steam does in boiling water. But since lava becomes increasingly viscous as it cools, some of these rising bubbles are eventually trapped near the surface and give a spongy appearance to the top part of a flow, while the lower part may look about as porous as a piece of caramel candy. For this reason superimposed lava flows are as readily distinguished as the layers in a heavily-frosted cake.

Twenty miles beyond the ice caves the great sandstone rock called El Morro towers above the surrounding valleys of *malpais*. It is probably the New World's most interesting stone autograph album. In centuries now long dead pueblo-dwelling Indians wrote upon its soft sides in crudely-carved pictures and then, in 1606, came the great Spanish conquistadore, Juan de Oenate, who left an inscription upon its sides saying that he was on his way to the discovery of the "Sea of the South", the Gulf of California, which he eventually did discover. Since Juan's time hundreds of adventurous souls have left their records there, and today the rock is a thrilling story book with pages always spread open so that he who cares to may read and dream.

On top of El Morro are the ruins of two ancient pueblos, and a few miles beyond lies the intensely interesting modern village of the Zuni Indians. Perhaps those ruins could tell much of the history of the Zunis and their five ancient villages. As yet the archaeologist has not touched them. What thrilling revelations may be locked up beneath these ancient roof-tree ruins.

RECORDS OF EARLY EXPLORERS HAVE BEEN CARVED IN "EL MORRO"

In 1606 Juan de Oenate left the inscription that he was on his way to find the "Sea of the South," the Gulf of California; centuries earlier unknown native tribes carved here their picture writing



KINKAJOU

A lovable pet—if you can endure his mischief-making

By MARIE-ANNE JORDAN

KINKAJOU is certainly an odd name and would give no clue as to the identity of its owner, whether it be bird, beast, fish, vegetable or flower.

A little more than two years ago there came to our house by express a crate from Colon, Panama. Just what sort of thing it contained we could not imagine, for upon approaching this crate the strangest sound came from inside. *Hrrr-rr-r, hrrrr-rrr-r* and *hrrr-rr-r* again. It sounded forbidding. However, with a bit of apprehension we opened the cover, and from a quantity of orange and lemon wrappers peeked the cutest animal we had ever seen. When he spied us he ducked back into the papers like a prairie dog popping back into its hole. After a few minutes he emerged again, slowly and cautiously, as if to make a survey of his surroundings before venturing farther.

His head was broad and round, with bright little eyes and short round ears. His body was long and much like a weasel in size and shape, with a long prehensile tail. The fur was dull brown on top running to light tan underneath, and the hair seemed to grow from the head and tail toward the middle of the body, probably a provision of Nature for the purpose of shedding water whether the animal was hanging by his tail or sitting upright.

"What is it?" said my husband. "Don't know," said I, "but I could name several things that it is not."

We were told that this little animal is called a kinkajou, and that his home is in the forests of southern Mexico and Central America. Of other information we had none, so the library of the Natural History Museum was consulted for further facts.

There is comparatively little written of this stranger, and as he is nocturnal, not a great deal seems to be known of his life and habits. In some places he is called a honey-bear, but this is a misnomer, for he is not a bear but belongs to the raccoon family.

In their native state these animals travel in small bands composed of several families, ranging in size from the very young to those full grown. They spend most of their time during the night going from tree to tree, feeding on the sweet ripened fruits. When eating they are just as much at home hanging head down as they are in an upright position. Sometimes when they are on the ground they catch and eat small mammals, frogs and insects.

Owing to the fact that they walk on the soles of their feet they are placed in the plantigrade family, and consequently their gait when travelling on the ground is awkward and lumbering, like that of the skunk, raccoon and bear, which are also plantigrades. The soles of their feet are sensitive to touch and to heat and cold. With their long toes they handle things much in the same manner as does a monkey, except that they do not have opposable thumbs. They make their homes in holes dug in the ground, and under the roots of trees. Here the young are brought forth, not more than two in a litter.

MELON IS A FAVORITE FOOD

Kinka sits on his haunches, grasping the delicacy with his hands in human fashion

These little fellows will enter a camp at night and make themselves perfectly at home, running and jumping about the place, stealing whatever food they can find, tipping things over and making the place look very much like Satan and a gale of wind had invaded the premises. They are so friendly that the natives capture them with little difficulty, killing them and selling their pelts. Their coats are warm, soft and durable and have a ready sale in the fur market. For this reason, I have been told, these little animals are likely to be exterminated.

For more than two years we have had one of these little chaps for a pet, and his playful affectionate ways have endeared him to the family. If we go away and leave him with strangers, it is evident on our return that he has missed us, for he follows us about and climbs into our laps, snuggling very close and making all the while a contented little *queek, queek, queek.*

At breakfast time he is fed a dish of warm cereal and milk. If this is not served promptly, he notifies the household of his displeasure by squeaking impudently and shaking his box with such violence that he often tips it over. When his stomach is well filled with nice warm food, he is a lovable little beast and will tease to be petted

and put to bed, where he curls up and sleeps soundly all day. Toward evening he is awake again and ready for his evening meal. At this time he is allowed his freedom in the kitchen. This little imp has a temper and he is not in the least bashful about showing it. He knows his mealtime just as well as any child, and if he is not fed on schedule he makes himself disagreeable. Taking flying leaps at us from the chairs and stools, biting and tearing at our clothes as though to hasten the service, he is a perfect example of a wild little beast. But after he has eaten his fill, he is affectionate, playful, full of monkeyshines and ready for any kind of mischief or for a frolic.

He runs about the room, jumps from chair to chair and runs across the table, sweeping along with his powerful tail any object that happens to be in his path. His first objective seems always to be the sugar bowl, and into this he dives up to his ears. Holding it tightly in both hands, he laps up the contents, often emerging with his face well coated. In the same manner he absorbs the contents of a glass of water. He is passionately fond of honey and if given a spoonful will sit on his haunches, turn the spoon over and over in his little hands, lapping it to get the last taste.

He seems to enjoy running about with something in his mouth. He may find a piece of paper, or cloth, but best of all he loves to steal a silk stocking from the drying rack. This he will drag about the floor, shaking and tearing it like a puppy. When I cuff his ears for being meddlesome, he holds his hands tightly over them just as a child would do.

For our family menagerie he seems to have a great fondness. By this I do not mean affection, for I think his fondness is largely for teasing. Poor Peter Rabbit gets mauled until in sheer desperation he gives a mighty stamp of displeasure with his big hind feet and hides away in a far corner. Jimmy Skunk comes in for a share of the punishment too, for Kinka chases him round and around the room until Jimmy is all out of breath, then in a belligerent manner Jimmy turns about face and stamps his front

WE ARE THANKFUL FOR KINKA'S SWEET TOOTH

His mischievous antics can always be stopped with a spoonful of honey

PHOTOGRAPHS BY FRANKLIN I. JORDAN

feet, daring Kinka to come one step nearer. Instinct tells Kinka that he has gone far enough. Then there is Robert, the tiger bobtail cat. When he feels very playful, these two will race about the room, roll about on the floor and sometimes stage a couple of amusing bouts. Kinka's favorite trick is to make a flying leap from the top of a chair, landing on the cat and upsetting him, dignity and all. This roughhouse continues until Robert has had enough and he beats a retreat to the top of a high stool. Evidently Kinka does not take the hint, but will seize the stool in his hands and shake it with all his might, dislodging the cat and throwing him to the floor to start the fight all over again. It is amazing to see the vigor with which this small animal can shake a stool many times as large as he.

Kinka loves to pull and haul at the woolly coat of our good-natured airedale, who sits and suffers in silence. However, there is one member of the menagerie who is unmolested by this little mischief-maker—the big green parrot who sits in a most dignified manner in a great brass cage. Kinka has a good memory and his experience at their first meeting was vividly impressed on his mind. Being naturally curious, he must climb to the edge of the cage and find out what manner of thing was inside. The scent of the bird and the sight of those bright feathers moving about in the cage were a great temptation that Kinka apparently could not resist. In went his little hands through the bars of the cage, but instead of grasping a handful of feathers he was rewarded with a smart pinch from Polly and a jeering *ha-ha-ha.* Being more or less persistent, he tried two or three times, but with the same result. Just to show Polly how he felt about it he proceeded to shake the cage so vigorously that he upset the water dish. Finally he decided that there was nothing to be gained there, so he turned his attention to some other mischief. Since that time he has let the big brass cage and its occupant alone.

Frequently when he is in the kitchen, I fasten him to the leg of the table in order that I may do something beside shoo him out of this, that and the other thing. Having a very inquiring mind he will investigate anything that is within his reach. One morning while he was moored in his accustomed place, he spied a basket of clothespins on the floor and immediately tried to reach them. He stretched his arm as far as he could, but couldn't quite make it, so he turned around and tried with his hind foot. This didn't work either. At last he decided that perhaps his tail might be of some assistance, so reaching toward the basket, he managed to hook the end of his long caudal appendage over the edge, and pulled the basket over to him. The basket and contents were soon well investigated and strewed over the floor. It was interesting to watch this performance, for it showed that the little beast did do some thinking.

Feeding this pet is not much of a problem. He is fond of sweet fruits. A banana is quickly peeled and dispatched in more or less large mouthfuls. Raw oysters will disappear just as fast as you can feed them to him. He loves melon and this he eats human style, sitting on his haunches and holding the slice in his hands. Raw cabbage is tempting roughage, and when he is given a whole one he will lie flat on his back, hold it firmly with all fours and tear the leaves away. His long tongue will clean out the shell of a half orange in a far more efficient manner than the finest orange spoon in the hands of a human being.

People who are fond of animals cannot help falling in love with his endearing ways, his dog-like affection and his human-like mannerisms.

•

Frail Beauty

O Molten dewdrop, trembling in the light
  Of dawn, and clinging to the brookmint-blade—
  A pendent opal on a breast of jade—
How came your splendor, so limpid and so bright?
How your clear symmetry? And what weird sleight
  Of art suffused you with each rainbow-shade,
  Captured your evanescent hour, and made
A quivering soul from fire and mist and night?

Fleeting your span! Yet I shall be content
  To let the Cosmic Power that built in you
Such frail wet beauty, such luster opulent,
  And such immortal life as lies in dew,
Fashion the fragile moment of my soul
In what frail shape It deems a perfect whole.

From *Slow Smoke* by LEW SARETT

DAYLILIES MAKE ATTRACTIVE BORDERS FOR GARDEN POOLS

PHOTOGRAPHS BY A. B. STOUT, NEW YORK BOTANICAL GARDEN

Here, it seems, is the perfect flower for the amateur horticulturist. Hardy, fragrant and graceful in form, the author claims they are always a success. Photograph taken in the garden of Mrs. Elizabeth Tyree Metcalf of Bedford Hills, N. Y.

Hemerocallis—The Dependable Lily

By THURLOW WEED

THE YEARS through which man has been growing garden flowers may be divided into definite periods. In each period, much advancement was made in a particular perennial or bulb plant because of the interest taken in its development by hybridizers of the day, their success in turn stirring the interest of amateur gardeners. Thus during the sixteenth and seventeenth centuries, interest was largely centered on the tulip, and many beautiful varieties were originated. The rose, peony, dahlia, delphinium, gladiolus, and iris each have had their period of intensive development.

The present second quarter of the twentieth century promises to be the period devoted to the improvement of *Hemerocallis,* or daylily.

In America, such noted hybridizers as A. B. Stout, C. Betscher, Hans Sass, and Clint McDade have produced striking improvements over the older sorts. Perry, Mead, and Yeld in England also are doing much to improve this flower. Within the last decade the color range has been greatly enlarged, and the blooming season lengthened; and the number and size of flowers and the height of the stalks have been increased.

The daylily—despite its name—is not a true bulbous lily, since it propagates from tuberous roots. The lily-like blossoms are funnel-shaped and are borne on many flowered stems well above the foliage so that they add a striking note to the garden picture. The foliage is thick, grass-like, and graceful. The flowers vary in color from yellow to tawny red, including shades of apricot, salmon, orange, buff, citron, gold, cream, and delicate pink. Each variety blooms for several weeks; a selection of well-chosen sorts will yield blossoms from May until mid-September. The species vary in height from one and a half to more than four feet.

The tuberous roots may be planted satisfactorily at any season, but do best when moved in the cooler, moist months from September to April. They should be placed three inches deep in rich garden loam, with the ground well-spaded a foot deeper. The tubers should have plenty of room in the hole and should be spread out before the soil is worked around them.

An attribute that is doing much to increase the popularity of this lovely flower is the fact that the plants will grow and bloom satisfactorily in practically any soil, climate, or location. During the recent severe drought in the mid-west, the daylilies were the only perennials that escaped unscathed. In the cold sections that were hardest hit by the severe weather of last winter, *Hemerocallis* pulled through unharmed. Not only will they exist in very dry soil, but they will grow when half submerged in water or planted in very damp ground. They grow indiscriminately in full sunlight, partial shade, or total shade.

The plants, however, like all other perennials, grow best in a reasonably rich, loose soil in a spot where the sun strikes for a few hours at least each day. Occasional watering and stirring the dirt will aid the development of the plants and result in more vigorous foliage, taller bloom-stalks, and larger blossoms.

Another attractive feature about *Hemerocallis* is its freedom from disease and insects. Plants are sure to grow. Many of the bulbous lilies are difficult to raise and have an annoying habit of dying out completely for no apparent cause. The daylily never dies out; it continues to multiply and spread each year. After a few seasons, of course, the roots become overcrowded and exhaust the nourishment of the surrounding soil so that it is advisable every four or five years to take them up and divide. The divisions may be planted in a new location or re-set in the old one, providing the gardener has mixed some sort of fertilizer in the ground. Any type of manure or commercial fertilizer is satisfactory. Plants will bloom the first season following planting, although the flowers do not reach their peak of perfection until the second year.

These plants are excellent for naturalizing, especially along streams, on banks, or beside lily ponds. Many gardeners plant them in specimen beds while others incorporate them in the border. The fresh green foliage makes the plants attractive even when not in bloom.

The early flowering varieties combine beautifully with irises, peonies, and poppies, while the later bloomers contrast vividly with delphiniums.

While the plants of *Hemerocallis* do not die out even if neglected, neither do they present the perplexing problem of the Oriental poppy, which can hardly be eradicated from the ground in which it is once planted. The daylily tubers do not penetrate to any considerable depth. Clumps are removed easily and the ground may be used at once for other purposes without the annoying process of removing young plants that spring up from parts of roots remaining deep within the soil, as is the case with some other perennials.

The flowering season of the daylily, coming as it does in mid-summer, makes this perennial invaluable for brightening up the garden when flowers are scarce and colorful display is very much at a standstill. Many bulbs, shrubs, and perennials bloom in the spring or fall, but the ones that flower during July and August are limited.

It is interesting to note that the word "*Hemerocallis*" signifies in Greek "beautiful for a day." If, as some hybridizers confidently predict, new sorts are originated that will bear flowers lasting more than a single day, the name will become inappropriate.

The flowers of the daylily, due to their odd feature of lasting but one day, do not make as good bouquets as long-lasting roses, orchids, and other flowers. The many buds on each bloomstalk, however, do not open simultaneously, and so by removing withered blossoms and waiting for other buds to open, one may have a reasonably satisfactory bouquet for the house as long as a week. A single spike may carry from eight to eighteen buds, opened flowers being five inches long and nearly as wide.

A BEAUTIFUL BOUQUET

The beauty of these flowers when arranged in a vase can easily be seen. This is the *H. multiflora* hybrid

At one time the most noted hybridizer of them all, Luther Burbank, became interested in this perennial. He made a few crosses and produced a limited number of seedlings, introducing the best one under his own name. Unfortunately, Mr. Burbank's interest strayed to cactus and fruits, and he abandoned his efforts to improve the daylily strain. This action doubtless retarded the development of this flower for several decades.

The dozen original wild species were found throughout the north temperate zone from Europe eastward to Japan. Until about a decade ago about half of these had found their way into commerce. Now there are available more than a hundred varieties, so far superior to the old kinds that comparison is futile.

Selecting a limited number of choice specimens is becoming increasingly difficult each year as new, improved sorts are made available for the amateur by plant wizards. One must consider not only the colors desired but also the height of the bloom stalks and the particular flowering season of the various varieties.

Plants packed in damp moss may be shipped for long distances and left out of the ground for many days. While a few nurseries carry a limited number of the older varieties, the new improved hybrids can be obtained only from commercial gardens specializing in perennials such as irises, peonies, Oriental poppies, and daylilies or from the hybridizers themselves.

The reasons for the growing of *Hemerocallis* by the amateur gardener may be summed up as follows: (1) rare beauty, rich coloring and charming grace of form; (2) fragrant display from early May until mid-September; (3) unsurpassed hardiness and freedom from disease and insect pests; (4) ease of growth in any soil and in any climate; and (5) clean and decorative foliage from spring until winter.

Remember—*Hemerocallis* plants are sure to bloom; they are *always* a success.

The White-Marked Tussock Moth

The life drama of a shade tree pest

By JOHN G. HOPE

Wagner Free Institute of Science

DRAWINGS BY THE AUTHOR

THE ADULT MALE MOTH

He is a grayish, dull-colored moth with a wing-spread of about one inch

THE WHITE cocoons that so disfigure the venerable bark of our shade trees proclaim that here the white-marked tussock moth, *Hemerocampa leucostigma,* has taken lodgings. Among the meager selection along our streets it finds the cottonwood most toothsome. However, the caterpillars feed upon many plants including the apple, pear and other fruit trees. The sycamores bear but few cocoons, and one wonders if instinct does not warn the young caterpillar that the sycamore sheds its bark, making it an extremely hazardous place to spin a cocoon. However, the presence of some disagreeable taste in the leaves is the more probable explanation of the avoidance of these trees by the larvæ. The cottonwoods are soon stripped of foliage by these marauders and the ugly cocoons attract the attention of every passer-by.

If we stop to examine the bole of one of these infested trees the larvæ may be seen. The baby is born, not with a silver spoon, but with a potential rope-ladder in its mouth. He has been given the ability to secrete a delicate, gossamer thread, which permits him to drop from one luscious leaf to another with safety, and also to make his way back again much as did Theseus in the labyrinth of the Minotaur. Later this is discarded. When full grown the larva attains the length of one and one-half inches. It is rather an elegant object, having a ground color of grayish-green with a streak of jet down the middle of its back. On either side of the black streak is a narrow band of yellow. Its head is of a brilliant coral red surmounted by two long tufts of black hair. Two protuberances of the color of the head also adorn the rear end of the insect's body. A brush of brownish hair, tipped with black, extends upward at an angle of 45 degrees from its caudal extremity. Anteriorly, rising from the central black streak, are four tufts of white to creamy hair, reminding one strangely of a discarded tooth-brush. Laterally, each segment bears another bunch of bristles on either side. Its locomotion is a beautiful set of rhythmic waves.

Even in the larval stage differences in the sexes may be plainly seen. The female larva is the one to which the foregoing description applies. The male is yellower as well as smaller. The females outnumber the males.

After a few weeks of constant feeding the larva spins its silken crypt as a preparation for pupation. As is usual, the larva is assailed with a strong unrest, and leaving his leafy abode descends on the trunk of the tree. Here, in one of the deep crevices of the bark, he begins to spin. The cocoons are composed largely of hair taken from the body of the caterpillar and mixed with silk. Weaving his head from side to side, a living shuttle, he soon completes the task. As a finishing touch the opening at the top is closed with the caudal brush.

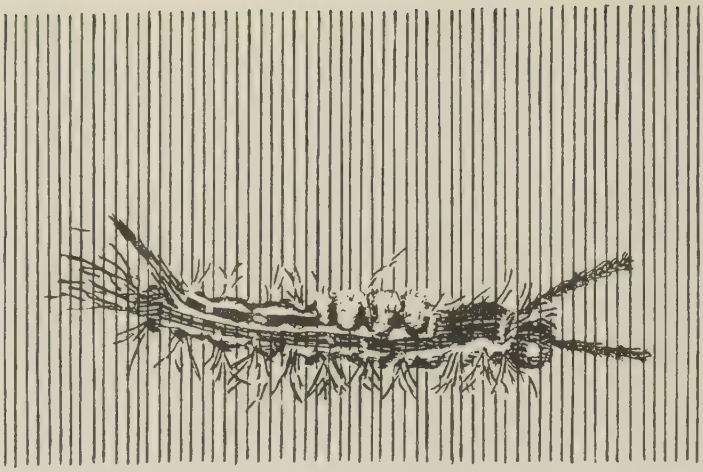
At last secure, the larva is now devoid of his ornamentation, which has found practical use in the building of the cocoon. Gradually becoming dormant, the caterpillar shrivels; its skin becomes papery, brown and hard. In this shell the miracle of pupation takes place.

There emerges, depending upon the sex of the caterpillar in the cocoon, either a grayish moth with a wing spread of approximately one inch, or a curiously misshapen wife. She is a small fluff of light gray hair and scales with but a mere rudiment of wings. Never will she know the glories of flight. Merely a reproductory machine, she stays quietly at home until the male comes seeking her. After the nuptials she deposits her mass of eggs, usually atop her former silken sleeping bag. These she covers with a froth mixed with hairs from her body. The future of the race assured, she quietly dies.

If the eggs are laid in August, they last the winter through before hatching. The instinct of the female is now plainly seen. The froth, containing the hair, forms a warm coverlet, excellently insulating the eggs against winter winds. In early spring, immediately after the appearance of foliage, the eggs are warmed to life by the sun. Emerging, already equipped with their curious rope-ladders, the youngsters begin to feed and the cycle begins anew.

In Canada there is but one brood a year. However, the central and southern states may see as many as three broods annually.

As each egg-mass contains several hundred eggs, our



THE CATERPILLAR OF THE TUSSOCK MOTH

Nature provides no less than 21 parasites as a means of controlling this pest

trees would be quite overrun with these pests were they not checked in some manner. As is usual, all-wise Nature has supplied parasites as a means of control. Dr. L. O. Howard mentions no less than twenty-one of these insects whose children depend upon the death of the tussock-moth larvæ for their own lives. The two that the writer has observed are close relatives of the wasps and bees.

One of these, *Chalcis ovata,* is quite a pretty creature, though a mere one-fifth of an inch in length. Her body is of the blackest jet, while her anterior feet and the greatly-enlarged tips of her posterior femora are yellow in color. Altogether this atom of destruction presents a placid appearance, and does not at all seem the treacherous murderess she really is. The Chalcid seems to find the pupal stage the most convenient on which to operate. Running over the silken bag, her antennæ evidently acting as a divining-rod, she finds the correct spot at last and thrusts her ovipositor through the silk into the pupa. She may remain in this position for as much as three minutes, her abdomen visibly pulsating. The pulsations no doubt force the eggs through the ovipositor into the victim.

The other common parasite is *Pimpla inquisitor.* This sleek, black half-inch of terror is armed with a stiletto-like ovipositor. The victim selected is usually in the act of spinning-up, or is already clothed in his silken garment. The mother *Pimpla* runs over the cocoon, her mobile antennæ vibrating, until at last, finding a suitable place, she brings her stiletto forward and thrusts it through the silk into the body of the caterpillar. The struggles of the afflicted creature are of no avail, the operation goes smoothly on. This demon is well named the "Inquisitor"! The first thrust taking effect, *Pimpla* withdraws her dagger, and moving it slightly, thrusts it in again and again, depositing her eggs. The first stab seems to be for the purpose of quieting the caterpillar so that the eggs can be deposited without its struggling.

From these cocoons will emerge no proud moth to wing his way upward, nor a female to await quietly the coming of her mate. They are rather sarcophagi from which will be liberated an evil brood to seek out more caterpillars on which to perform their disastrous operations. These are acts of infamous treachery, providential good-fortune, or merely maternal solicitude; depending upon the view-point of the young moth, the trees, or the mother parasite. The babies of these parasites use the great stores of fat laid up by the larval form against his dormancy to their own advantage, and gorge upon the very life of the ill-fated creature. Tragedy, the drama of birth, life, courtship and even murder, go on under the very eyes of thousands of passersby every day.

THE PUPA

The cocoons are made of silk mixed with hair taken from the caterpillar

If you do not care to trust these parasites with the welfare of your trees when the tussock moth is abundant, the U. S. Department of Agriculture recommends a spray of arsenate of lead to control the young. The Department also states that much relief may be secured by creosoting the egg-masses as for the Gypsy Moth, or by burning them.

While the tussock moth presents such an interesting story, it is to be hoped that the mother parasites will do their duty well for the sake of our old friends, the trees.

●

We have received a number of inquiries from teachers and others asking whether extra copies of our Rotogravure Section could be obtained separate from the magazine. Most of these teachers wanted the extras for mounting, posting, scrapbook, or other class projects.

Owing to certain mechanical considerations in connection with printing the magazine, we have on hand some extras of the Rotogravure Sections from October, 1934, to date. Therefore we are making available complete, unbound and untrimmed sets of the first twelve months (192 pages of Nature pictures) of the Rotogravure Section at one dollar a set, or the first or last six months (Oct., 1934, to Feb., 1935, or March, 1935, to Sept., 1935) at fifty cents a set. Extras of one particular month are available at ten cents each as long as they last and *provided at least ten extras from any one month are ordered at one time.* In the event that one or two months of 1934-1935 become exhausted it may be necessary to substitute separates of some more recent issues to complete the set of twelve.

PHOTOGRAPHS BY OLIN SEWALL PETTINGILL, JR.

MACHIAS ISLAND, MAINE, IS THE SOUTHERNMOST BREEDING GROUND OF THE PUFFIN

This bird has been wise in its choice of a nesting place, as the rolling swells of the Bay of Fundy make landing from a boat a hazardous task

The Puffins of Machias Seal Rock

By ANNE E. PERKINS

MACHIAS SEAL ISLAND, situated near the United States-Canadian boundary in the wind-swept Bay of Fundy, is noted for its colonies of sea birds. The island is treeless and rocky in sections, and has an area of twenty acres. Lying low in the water, it is nevertheless seated on a submarine base so broad that heavy seas break far out from shore and so do not destroy the nesting grounds.

Arctic and common terns nest in abundance, and greet the intruder with raucous cries when their nesting grounds are invaded. So well do these birds and their eggs blend with the surroundings that it is with difficulty that one can walk about on the rocks without crushing them. The southernmost breeding ground of the puffin or sea parrot is on Machias Seal. Formerly laying its eggs in burrows, it now nests chiefly in crevices in the rocks, and like Leach's petrel, another breeder, has only one egg. The period of incubation is unusually long. The male bird sits by day, the female by night. The burrow is as long as one's arm, often winding, and usually under a boulder, where it is unaccessible. This and a few other islands are the last breeding grounds of this species on the Maine coast. The birds, in their sooty plumage, are unattractive in appearance and appear dazed when taken from their burrows.

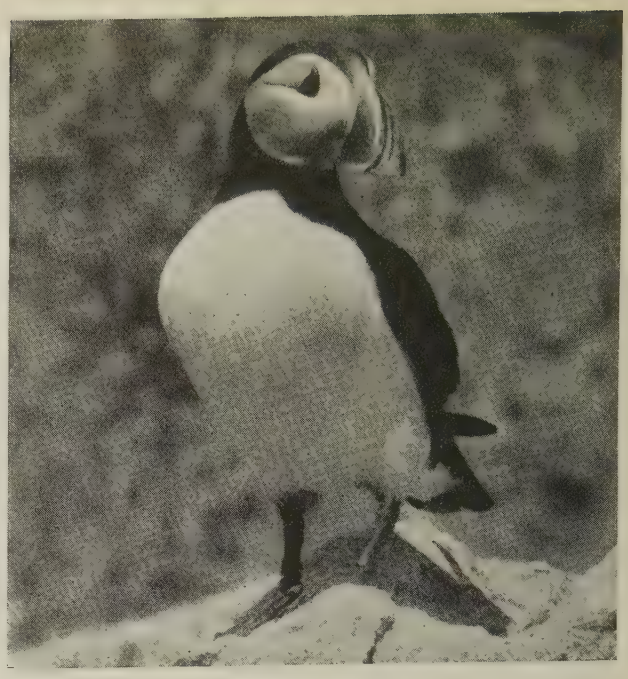
The puffin has orange red feet and eyelids, and a large parrot-like bill cross-striped in brilliant red, orange and purple. It is white underneath, black above and has a white neck and collar. Serious wounds can be inflicted with its powerful beak.

Chapman says, "one has only to see a puffin to realize why it is commonly known as a sea parrot; and when the bird hovers on its short rounded wings before alighting it bears a strong resemblance to a Japanese kite." According to Frank A. Brown, 300 pairs were estimated to be nesting on this one island in 1911. There is no such number there today and protection is necessary to save this interesting bird from extinction.

The birds walk and stand on their toes, presenting a fascinating but ludicrous appearance as they strut about on the rocks. Their flight is similar to that of a duck and when resting they usually squat with feet and body close to the rock. Audubon visited Eastport, Maine, in 1832, and may have visited this island, although he seems to have left no record other than the fact that he saw the birds among the islands. For many years, at least, this has been the only breeding place for the puffins in this vicinity.

The islands and the birds were forgotten until 1903 when William Dutcher, president of the National Association of Audubon Societies, began seeking aid in an effort to protect them. He corresponded with Charles F. Seeley, keeper of the lighthouse on Seal Island, who gave the birds the protection they needed for many years.

Returning from the island, we passed Seal Rocks, where we saw harbor seals, hooded seals and great gray seals diving for fish and sunning themselves on the shore. The razor-billed auk, another sea bird that once inhabited the vicinity in large numbers, was spotted on Grand Manan Island. They too are diminishing.



A CLOSEUP OF THE PUFFIN

If taken on a color film, this picture would show a bird with orange-red feet and eyelids, white underparts, and a bill cross-striped with red, orange and purple

The sea birds of the islands of the Bay of Fundy are assured some natural protection from man, as the rocky islands are difficult to approach unless the sea is absolutely calm. The rolling swells make landing hazardous. Many of the islands of the group are uncharted on maps, and navigators of the channels are unaware of the existence of some of them. They are sufficiently distant from shore to be excluded from the local government jurisdiction of most towns, their only value being as locations for lighthouses and fog signal apparatus, indispensible to the navigation of the Bay of Fundy.

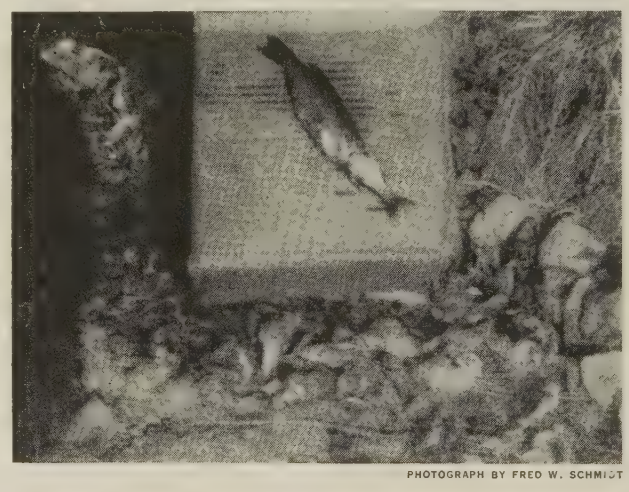
Was This a Head-on Collision?

By JOHN D. RHODES

"COME on down here and tell me whether the black bass in this lake are losing their pep."

This challenge came from friend Hugh, boatman on Brant Lake, in the Adirondacks. As I answered his call I was a little suspicious of some prank. But I was wrong.

Floating in the clear waters of the lake, just offshore, was a small-mouth black bass. Wedged in his mouth was a glistening golden shiner. The bass balanced in the water, giving an occasional shake of his body in an impotent effort to dislodge the smaller fish. We lifted both out and put them in a bait pail, by way of proof.



PHOTOGRAPH BY FRED W. SCHMIDT

THE BASS AND THE SHINER

The two fishes photographed in the bait box before the bass' meal was rescued from its gustatory fate

A perennial subject of discussion among men keen after game fish is what happens when a fish grabs the bait. The most common belief is that when live bait is used—minnow, crawfish, or hellgrammite—the fish seizes the bait by the tail or legs, and, after a longer or shorter run, turns it before swallowing. In this case the bass had not only turned the shiner around, but had it upside down in its mouth in its attempt to consume it. The shiner, which measured five and a half inches to the bass' six, was a beautiful specimen, shaped somewhat like a sardine, and covered with small scales that scintillated in the bright morning sun like small pieces of gold coin.

This experience gives food for thought. It will be recalled as we sit around the fire at night and recount how we *know* we lost a big one because the hook was baited with a sizeable minnow or frog. On the very last day of a subsequent vacation, with a big minnow on the hook, we got a vicious strike on a long cast among lily pads. On reeling in the line, the bait was followed right up to the boat by a small pickerel, about ten inches long, which would rush at the minnow as we skittered it along the surface of the water a few feet from the boat.

However, the true fisherman will continue to embrace the opportunity of boastfully recounting how he just missed fame, when a hundred feet of line went tearing out through the guides, only to be caught under a rock or around a sunken tree or log, where a "really big one", with a piscatorial guffaw, disgorged the hook, and hurried away to other submarine practical jokes. In a case of doubt why not give the big fish the benefit?

THE NATURE PICTURE OF THE MONTH

"Peace" is the title that Dr. A. R. Cahn, long a teacher of zoology in the University of Illinois, gives to this effective photographic study of moonbeams bathing the water's edge and silhouetting the slender reeds of the shoals. The picture was taken on a lonely lake in Ontario, near the Minnesota line. It is, indeed, a peaceful scene in Nature, captured for all time by the camera's lens.

With the discontinuance of the special award for a "Nature Picture of the Month", effective with the October issue, the Rotogravure Editor does not mean to indicate a loss of interest in the work of Nature photographers everywhere. Good Nature photographs are desired for this section of the magazine. They will be purchased at regular rates. We want those who enjoy hunting with a camera to find in this Rotogravure Department a place where the products of their patient work may achieve publication, and, at the same time, bring in something to help defray the expense of their hobby.

THE BLACK WIDOW SPIDER

Photographically presented by Lee Passmore

Few spiders have received so much notorious publicity as the "black widow", known to science by its technical name, *Latrodectus mactans*. This species was first described in America by Fabricicus in 1775 under the name *Aranea mactans*. It belongs to the arachnid family Theridiidae. The black widow is often referred to as "the hour glass spider" because of a peculiar red mark that appears on the lower side of the abdomen.

The black widow occurs in many parts of the world within the temperate zones. In the old world it inhabits the southern and middle parts of Europe and Asia, south to New Zealand and Africa. In America the species extends from Southern Canada to Patagonia. Insects and other spiders become the prey of the black widow. Only the liquid parts are eaten, the juices being extracted through the wound made by the fangs.

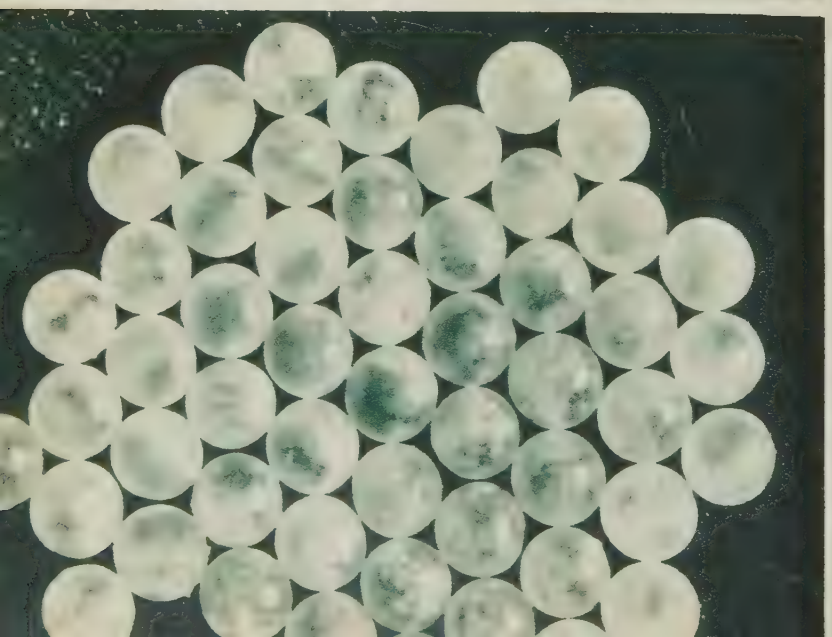
Because of the numerous reports of persons being bitten by this spider, an unreasonable degree of fear has been created. However, even though these fears are for the most part unwarranted, it is well that the public should become more familiar with the species so that they will be able to recognize it. The black widow spider is not on the increase, but has always been common. The bite of the female, while always very painful, is seldom fatal. However, the services of a physician should be obtained as soon as possible. Black widow

spiders may be destroyed by a liberal use of derris-root fly sprays such as "tick", which quickly kills them.

The picture on the opposite page shows the comparative sizes of the male and female black widow. The female is the larger. When the male finds his mate, she is made aware of his presence by the vibration of her web as he violently disturbs it. If the time has arrived when the eggs must be fertilized and she welcomes his coming, she will answer in the same manner. He then approaches, but each move toward her is made with great caution. She may suddenly decide to kill and eat her suitor. Even after she has mated, she has been known to kill the male and feast upon him.

In natural habitat, the black widow spider usually occupies darkened locations. A hollow stump or log makes an ideal spot for the spider to spin her web. A grassy place near a large boulder, as shown at the right, is often chosen for a homesite. In the open field she will use a crevice in the earth. Here the loosely woven web betrays her hiding place. When her nest is made near a boulder, which absorbs the heat from the sun, it helps to furnish a considerable degree of warmth throughout the night, assisting in the incubation of her eggs.

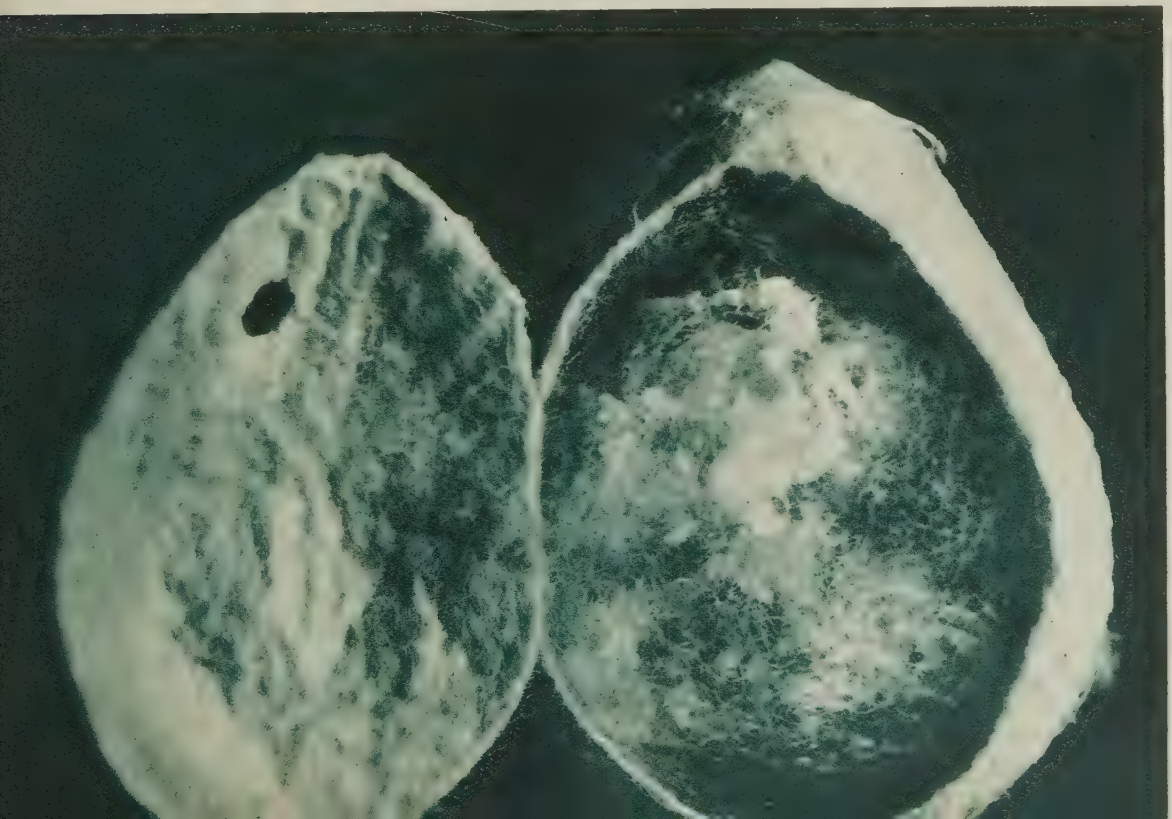
As shown here, the female often brings her egg-sac to the entrance of her nest, so that the warm rays of the sun will assist in the incubation of her eggs. In the late afternoon she takes it down close to the boulder for the sake of the heat absorbed during the day. The added warmth received throughout the night keeps the temperature more even and thus shortens the incubation period



The male spider is about one-third the size of the female. He may readily be distinguished by the lighter markings on his abdomen and by the large bulbs that appear on his pedipalps when he is fully matured. His front and hind legs, like the female's, are exceptionally long. The male spider generally is regarded as being entirely harmless to human beings. The ventral view of a female black widow spider, pictured at the left, shows the hourglass figure with its bright red color, blending delicately into the jet black of the spider's abdomen. This photograph was made possible by the use of a red color filter that absorbed the red markings and caused the figure to appear white in the finished picture. The abdomen of the young female is marked with white chevrons that remain until she has reached her full development.

The egg-sacs of the black widow measure about one-half inch in diameter. They are nearly oval in form and light buff in color. Being perfectly water-tight they afford complete protection to their delicate freight. The sac usually contains from fifty to three hundred eggs, and in exceptional cases nearly one thousand. Each egg is perfectly spherical and measures about one thirty-second of an inch in diameter. From one to seven sacs of eggs are laid between February and November. The period of incubation may be from twenty to thirty days, depending, to a great extent, on the temperature. In this picture we see fifty-three eggs taken from an egg-sac that contained more than three hundred.

Black widow spiders will kill and eat one of their own kind if they become very hungry. The "killer" shown above was confined without food for several days. When she was placed on a branch with another large female, she immediately attacked and tied the legs of the other, rendering it helpless. She then bit it several times; it is evident that the black widow is not immune to the venom injected by the fangs of another individual. After feasting on the juices of her victim, the aggressor cut the web that held her victim to the branch. Each mandible of the black widow spider is armed with an extremely sharp claw or fang, near the point of which is a minute orifice from which a small quantity of poisonous liquid instantly enters the wound. The poison glands, as in all spiders, are situated in the cephalothorax and the venom passes through a tiny duct into the fangs.



The egg-sac shown on the preceding page was opened to display its contents, which comprised a hundred or more cast-off sheddings of the tiny spiders, along with the egg shells from which the young were hatched. Even at this early stage, the spiderlings were able to spin a delicate webbing that completely fills the egg-sac. When they became strong enough to leave the sac, the young ones cut a hole near the small end and through it made their exit.

Almost immediately after the young spiders emerge from the egg-sac, they begin to spin their tiny webs, attaching them to the empty sac and spreading the filmy threads out to the neighboring grass stems. The mother spider meanwhile remains close to her offspring, ready to defend them should an enemy appear. She is especially aggressive when guarding her young, and if disturbed will attack any intruder. The last photograph shows an old egg-sac and the partly grown spiders about ten times natural size. The young remain near the home egg-sac for several weeks, sometimes preying on each other if no other food is obtainable. Many become the prey of their natural enemies and few are left to reach maturity. Those that survive soon seek a home for themselves to carry on the race.

Palestine Flowers

This and the two pages following represent plants native to Palestine. The photographs are from William Thompson.

Colchicum decaisnei grows from a corm or rootstock and its pale pink or white blossoms open in October and November. It is native in middle and sub-alpine Lebanon. It is called saffron, but Tristram says that the real source of saffron is *C. sativum.*

Apples of Sodom are considered by most authorities to be the fruit of *Colotropis procera,* which grows from the Dead Sea south to Sinai and Egypt. Its leaves are fleshy. The implied worthlessness of the fruit may be because it turns out to be merely a mass of silk-winged seeds.

Meadow saffron, *Colchicum stevensi,* bearing pink flowers, occupies the coast country of Palestine, and the lower slopes of the nearby ranges.

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Narcissus tozetta is one of the species from which many of our modern strains have been developed. It is also considered by many students of the subject to be the plant referred to in the Bible as the Rose of Sharon.

Romulea bulbocodium, related to the irises, is an inhabitant of sandy and rocky places from the coast to the middle mountain zones. Its six-pointed star flowers range in color from pale violet to white.

This wild onion, identified as *Allium trichocoleum,* bears a mass of pinkish flowers on its upright stem.

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All our cultivated tulips are developed from plants native to Asia. Some of the species range in its southwestern parts, and it is therefore likely that this lovely one has figured in the ancestry of those that we now prize in our gardens.

Anemone coronaria, whose flowers occur in a variety of colors, reminds us of some of our larger American species. It grows widely in the Mediterranean region, and from it have been derived many of our horticultural varieties.

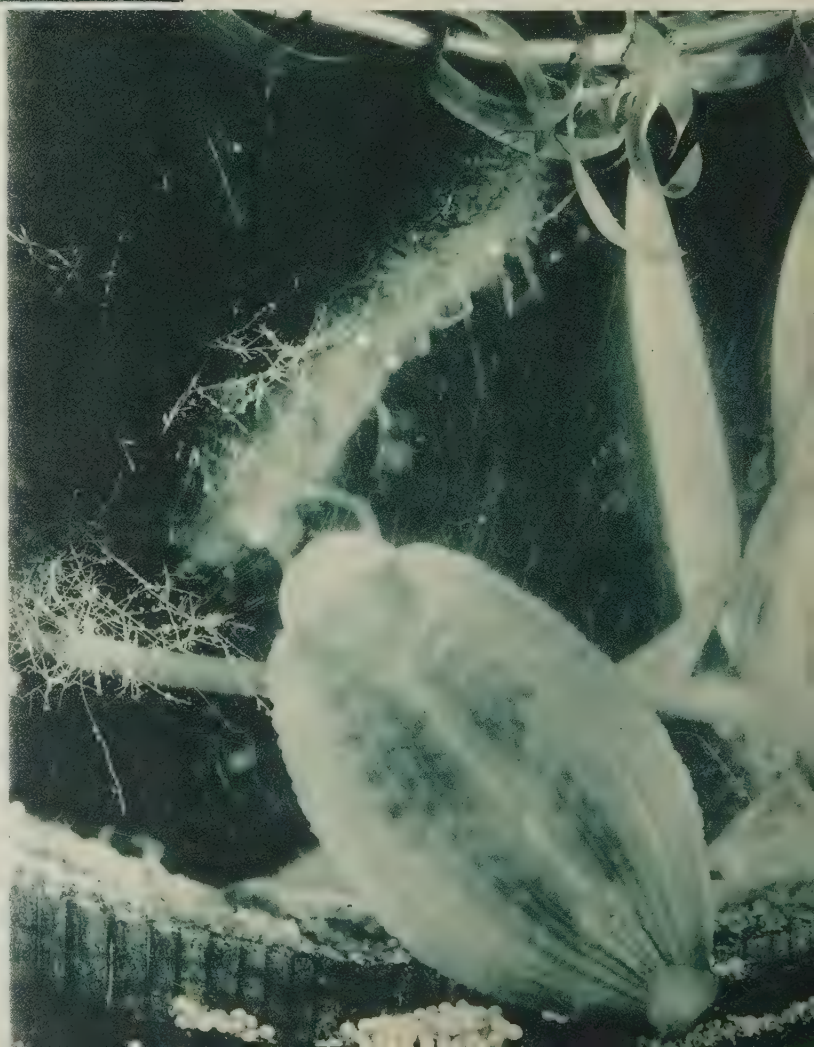
A cyclamen, probably *Cyclamen aleppicum,* is pictured at the right. The flower is pink and the leaf is reddish on its lower surface.

The Leech

Photographically presented
By Stanley Truman Brooks

Even the horny alligator snapping turtle of our southern streams is beset by enemies. This large leech was found on the naked skin at the base of the hind legs of one of these huge snappers. It had feasted mightily and as it was near the egg-laying period the leech was removed and placed in the glass photographic cell. When contracted the body was opaque, and in color a deep olive green, with spots of rich reddish-brown forming broken rows of color from the anterior part of the body to the large posterior sucker. As I watched, the leech attached itself to the glass and with slow, deliberate grace extended its body. This animal must be called *it*, since both sexes occur in the one individual. In the center of the body, above the large white disk of the sucker is a long tubular structure filled with dim, white objects. These are the eggs. The body, with the light shining through it, shows the dark, blood-filled stomach-pouches. Once these are filled by a good dinner on its host, the turtle, the leech can live many months without more food. The only change that will be noticed will be a gradual shrinking of the body.

The parent leech has laid its eggs. The many round, white pellets are held close to the body by an infolding of the broad, flat edges. The sudden heat from the photographic lights caused the body to contract and the eggs spilled to the sand beneath. As they lay at the bottom of the photographic cell the picture was made. If one observes closely four eggs may be seen still within the body of the parent leech. The mother-father leech usually retains the eggs within the folds of its flat body until they are hatched. For a short time afterwards the young are protected in the same manner; holding on either by their small suckers or by a viscous thread that anchors them to the parent. It is thought by some workers that the young gain nourishment from the albuminous secretions of the parent during this period of strap-hanging existence. While young and while free, living leeches feed upon the smaller individuals of their own kin, and the larvae and eggs of other aquatic animals. They partake of blood only during or prior to the breeding season.



The spider crab or sea spider, pictured above, is just a little out of place here on the sandy beach as its usual habitat is in deeper water a few hundred yards off shore. These crabs, often caught in the fishermen's lobster traps and brought to shore, measure about eighteen inches across. The kelp crab shown below was found in the kelp plant beds off the shore at Santa Monica, California. Photographs by Elmer H. Crook.

before hatching, the embryo acquiring various appendages and organs. The animal actually molts within the egg after about three weeks, and its membraneous covering grows larger to keep pace with the growth of the embryo. After hatching, the larva does not resemble its parents until after the next molt. Photographs by L. W. Brownell.

The hermit crab is an excellent example of adaption to environment. The peculiar habit of encasing itself in borrowed shells has modified the body structure to such an extent that posterior appendages have been reduced to mere vestiges, and the tail has become curved so that the creature can anchor itself more securely to its adopted home. Even the right claws and legs have developed more than the left, because of the fact that, from the shape of the shell, greater weight is borne on this side. Hermit crabs are hard fighters and will conquer and eat one another if the opportunity presents itself.

Three species of this crab are found in the shallow waters along the Atlantic coast. North of Cape Cod is the hairy and bright red *Eupagarus bernhardus.* From Cape Cod to Florida resides *E. pollicaris,* a pink and white species whose claws are granulated rather than hairy, and which inhabits the largest shells. The most abundant and the smallest of the hermits, *E. longicarpus,* has yellow-white legs streaked with dull green or blue.

The horseshoe or king crab has been well named the armored tank of the ocean. The large shield completely protects the softer interior of the crab itself as the creature looks out upon his surroundings through eyes that are fixed in the shield. Despite the fact that this crab is one of the oldest inhabitants of the sea, swimming is not its best accomplishment. Instead, its locomotion is of the pushing variety, the creature being successful in digging through the mud of the seashore by means of its efficiently arranged feet.

The female lays her eggs in a hole dug by herself at the water's edge, where low tide will expose them to the warm rays of the sun. They are fertilized by the male after they are deposited, a procedure not usual in the case of crustaceans. This done, the hatching, which takes place in from fifty to seventy days, is left entirely to chance. Astonishing changes take place within the egg

The beaver, *Castor canadensis,* in primitive times occupied almost the entire extent of North America, excepting the region north of the tree limit and the arid deserts of the West. The unrelenting pursuit of the animal for fur long ago depopulated most of the States and some of the Canadian provinces also. Protection in many places has brought about an increase and enabled the restocking of depleted regions. The story of Pleasant Valley Sanctuary that concludes the rotogravure section this month is striking evidence of the value of the beaver.

The marten is the American representative of the famed sable. Formerly of wide range, it is now rare in the East and greatly reduced in the West. In the forest it is one of the most agile and graceful of animals, usually making its home in a hollow tree on a nest of grass and moss. It is valuable as a forest animal in keeping mice and other small rodents in check. The money value fashion has put upon its pelt threatens its extinction.

The muskrat, *Fiber zibethicus,* is found over most of North America, exclusive of the treeless Arctic and the deserts. The numbers gathered in the fur trade exceed all other fur-bearing species combined, but such is the fecundity of the animal that it still persists in all parts of its original range. It has been amply demonstrated, however, that even the muskrat cannot stand unrestricted trapping, despite its large families. High prices for the fur endanger the future of this mammal and only wise management and restraint will perpetuate it as an American fur-bearing animal.

Parent musk-oxen rally to the protection of their young. These cattle of the north are truly Arctic. In recent times they have inhabited only the lands north of the limit of trees in northern British America and the Arctic Islands, including Greenland. The animals here shown were photographed by the Canadian Parks Department at Devon Island, Northwest Territory. The North American species is *Ovibos moschatus,* and word of it was first heard from fur-traders in the Hudson Bay region as early as 1670.

The badger inhabits the plains country of the United States from Indiana west to the Cascades, and from our southern border northward into Canada. With his flattened-out body, short legs, short tail and long hair falling from his sides, he is unlike any other American mammal. Wisconsin is known as the "Badger State" because of the former abundance of the mammal there, but its numbers are now everywhere greatly reduced. The badger has a litter of three or four young, born in the Spring. He is a savage and determined fighter when defending himself. The long soft hair is widely used for artist's and shaving brushes. Its pelt provides a fur of good quality, and the demand for this, and unreasoning persecution—unreasoning because the badger's lifelong occupation is the destruction of burrowing rodents—are fast exterminating it.

Sanctuary in the Berkshires

By Stuyvesant Morris Pell, Warden

To provide a sanctuary for wildlife, a small group of Berkshire people five years ago bought a 300-acre piece of overgrown farm and woodland in a valley near Lenox, Massachusetts. The valley, once a shooting ground for grouse, woodcock and raccoon, saw a new era dawn. Trails were cut, plantings made where necessary and streams were dammed in an effort to make the newly-born Pleasant Valley Sanctuary attractive to wildlife and the Nature student. A Nature trail was started, exhibiting trees, shrubs, herbaceous plants, animal work and everything of interest that could be found.

A miniature museum, which soon outgrew the made-over farm house, was removed to the re-

modeled hay barn. A two-acre pond, fed by the trout stream that flowed the length of the sanctuary, was dredged. Another small pond was dammed with pick and shovel, but there still did not seem to be enough water to attract the wild ducks. Song birds, woodcock and grouse nested abundantly, thankful for the protection from the gunners, but the wild ducks, which needed protection most of all, did not find in Pleasant Valley the secluded ponds where they liked to rest between long flights. Wing-clipped ducks and geese were introduced to attract the wild ones with no result. The man-made ponds were too artificial.

Then someone thought of the beaver. A two-acre plot of alder swamp was selected and fenced in, and, after a summer of patient work, two beavers were finally caught. Although the ground had been surveyed and the fence erected in such a manner that the beavers should have chosen the lower end of the enclosed area for their dam, they surveyed it all over again the first night and selected a spot at the upper end. Half the pool that resulted from their efforts therefore lay outside the fence where they could not use it. However, their pond grew rapidly and soon covered an acre of ground. Today, on an autumn evening, one can sit quietly beside the pond and see flocks of wood ducks, once threatened by extinction, hurtle out of the sky. Where there was once a tangle of lowly alder there is now a woodland lake where brook trout, beavers, muskrats and minks make their home. Herons, bitterns and redwings literally haunt the place, as do sandpipers and water thrushes. A Canada goose makes her home atop the beaver lodge, and has raised her goslings there for the past three years.

The beavers of Pleasant Valley have done their work.

★ Conservation ★

A section of Nature Magazine devoted each month to the expression of practical opinions on the vital issues affecting our use and abuse of natural resources, including wildlife, and dedicated to the purpose of assisting Americans to play a militant part in the attainment of constructive conservation aims.

ARTHUR NEWTON PACK, *Editor*

NATIONAL ★ PRIMEVAL ★ MONUMENTS

While the conservation progress and policies of the United States have been, in many ways, muddled, destructive and utterly inadequate, we have made some progress. In our National Parks we have preserved for posterity areas for the most part worthy of such distinction and preservation. Various State Park systems include places of lesser significance wisely preserved. Our National Forests also give some measure of consideration to posterity through the designation of permanent wilderness areas and through modern methods of forest administration. In a large number of National Monuments, scattered throughout the country, we have set aside smaller areas of importance.

All these splendid areas should be protected against encroachment and wisely administered for those who are to follow us. Currently, however, we witness a nation-wide drive, under the plea of finding work for idle hands, to open up, clean up and civilize much of our outdoors. Unfortunately a good deal of zeal has been directed at wilder areas in an attempt to make them what Nature never intended them to be. Things that belong to these areas have been taken away, and things have been added to them that do not belong.

In the face of this activity, Dr. E. Lucy Braun advances a suggestion that we most heartily endorse. She proposes the establishment, before it is too late, of National Primeval Monuments. These would be sufficiently substantial and representative areas that would preserve intact examples of every type of native vegetation. Ranging from the tropical hammocks of southern Florida to the rain forests of the Pacific northwest, and from desert flora of southern California to the spruce and fir forests of Maine, this vegetation is widely varied. Dr. Braun points out that "one by one these types of vegetation are being destroyed. It will not be long before some among them will be known only as things of the past."

Must we ordain, from lack of vision or interest, that our children shall know of these things only from books and pictures? This need not be and must not be. Dr. Braun gives us in a paragraph ample reasons why we should act and act quickly. She says:

"There are very real values attached to our primitive vegetation: *Historic* values, for into each of these sorts of vegetation in turn the frontiers of American colonization and civilization moved, and the pioneers used or contended with surrounding Nature, as the case might be. *Literary values,* for the literature of America reflects the inspirations gained from Nature. *Scientific values,* for only by the study of primitive Nature unmodified by man can we hope to understand the relation between environment and plant growth; to be able to apply this information to the best uses in land utilization, in agriculture, in grazing problems, in forestry; or to hope to have an adequate record and knowledge of our rich and varied plant life. *Aesthetic values* are at the root of human happiness and fundamental to much of life's enjoyment and artistic accomplishment. In the progress of the world's history, disregard of beauty, failure to appreciate beauty, has preceded national decline. Yet we are willing that one by one these different types of beauty be taken from us in a temporary quest for gain."

Among our National Monuments are those preserving representative cactuses in Arizona and palms in California. There is ample precedent for similarly preserving other typical floras. And the administration of our National Monuments is now directed toward preservation without exposure to the rash of "development" now breaking out all over the face of our country.

Substantial areas of the coast redwoods in California have been saved through the Save-the-Redwoods League. Dr. Braun is now actively working for the preservation of a primeval forest region of Lynn Fork of Leatherwood in Kentucky. Such splendid movements by private groups, or even by the States, are not enough. A national survey should quickly be made of remaining typical areas and a complete program of acquisition adopted. It need not be a matter of long investigation—indeed, it cannot be. The initial cost of adequate areas would be small, the administrative expense very little, but the ultimate value would be incalculable if we only have the vision to realize it.

EAGLE SHOOTING IN ALASKA ★ ★ ★

An article published in *The American Rifleman* for February, 1935, under the authorship of a devotee of this sport, is a good example of the type of propaganda that must be combated by those who deplore the wholesale slaughter that has met these splendid birds along the North Pacific Coast for the past several years. For pure heartlessness and cold-bloodedness this account surpasses anything that we remember seeing widely circulated. We quote from the opening paragraphs:

"Eagle-shooting, of all forms of rifle shooting, is a type of sport that is most attractive to the finished rifleman. It is not a game for a tyro, or one that can be played pleasantly or profitably with anything but the most highly specialized equipment.

"Unfortunately, there are few spots left where the eagle abounds in quantities sufficient to furnish consistent shooting or to justify the initial effort and expense incidental to successful hunting; consequently there are few riflemen who are familiar with this kind of shooting. I shall therefore try to give a sketchy picture of this purest of all rifle sports; a sport wherein the thorough shooter may have the fun of the game and incidentally pay his way as he goes.

"Southeastern Alaska is an eagle paradise. The birds abound in great numbers, and due to their predatory nature the territory of Alaska has seen fit to place a bounty of one dollar on each bird. The bounty has been on for some years despite the howl of the sentimentalists back in the States, who raise a great racket at the thought of slaying the national bird. The bounty is well placed, I am convinced, in view of the examinations I have made of the stomach contents of a large number of birds, and of the conversations I have had with **** highly-trained and efficient members of the Biological Survey and Alaska Game Commission."

The article is illustrated by a picture of the proud author holding in his hand a slain eagle, and another that shows "The largest day's bag—31 pairs of claws, including those in the gunny sack."

There follow detailed instructions for seeking out the haunts of the birds, and regarding equipment and methods, the relative merits of different makes of rifles, calibers, styles and speeds of cartridges, and types of telescope sights and binoculars.

"One can live off the country better in Alaska in the summer than anywhere else in the world."

The reasons given include the abundant stores of edible grass, fish, bears, clams, crabs and grouse and ptarmigan.

"It is not necessary to have either license or guide to shoot eagles. Deer and bear are protected against shooting for sport, but if one be a traveler, explorer, or prospector, and in actual need of meat, or is being molested in person or property, he may under the law shoot any game animal. The code of the North allows the taking of meat for food, but wastage is taboo."

Evidently neither author nor editor is troubled with the fact that the law accords this privilege only to explorers, prospectors and travelers "when in absolute need of food, and other food is not available." We doubt whether "the highly-trained and efficient members of the Biological Survey and the Alaska Game Commission," if consulted, would consider that "sportsmen" going to Alaska to kill eagles for the bounty, and intending to make the returns from their sport pay their way, would be accorded the privilege of living, even in part, on deer or grouse killed in summer, although the hospitable Alaskans would doubtless permit them to graze freely on the edible grass on the beaches.

Altogether, this is sad reading for anyone who is trying, for any reason, to keep a few bald eagles alive to afford inspiration to those who will succeed the present generation.

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YOU GOTTA REMEMBER

Forty years ago a small boy with a string and the conventional bent pin fished in a small pool for newts. He did not catch many, nor did he rise to become President of the United States, but the incident is still worthy of record. A group of boys with butterfly nets appeared suddenly one day beside the pond and one observed that the pin did not hook the newts—he suggested a fish-hook.

"No, that would hurt the newts; the pin is only to hold the bait. They hang on long enough out of greediness, and they live well in the aquarium afterwards."

"Huh? Betcha I could catch more in ten minutes than you can in a hour!"

There spoke the complete business man. He and his friends entered the pond with their knickerbockers rolled up and swept the pool almost empty of newts, weeds, snails—everything. They "got more," as they said, and left them on the ground where they lay. They ruined the pond in the process. Their butterfly nets were ruined too, but that made no difference. Father would give them new ones.

This is the spirit which we wish to combat. It is quite natural—to the person who does not think and has not been trained to remember that his neighbor deserves consideration. It develops the man to whom quantity is everything and quality less than nothing, for he judges all things by their price alone. He may even be a success, of sorts, but he is still an undesirable citizen. His is the mind that "corners" wheat, and believes that because one woman is beautiful, twenty women are twenty times as beautiful. He it is who empties the pond of fish and insists on doing a year's shooting in ten minutes. He is a busy man, you gotta remember!

—Stephen Haweis.

Are Salmon Now Sold Down the River?

What is the Attitude of the Commissioner of Fisheries?

By WILLIAM L. FINLEY

THE skeptical eye of every conservationist interested in the fish resources of America was cast at the Bureau of Fisheries when Frank Thomas Bell, real estate operator and political secretary to former Senator Clarence C. Dill of Washington, was appointed April 15, 1933, as United States Commissioner of Fisheries. The combined effort of various scientific groups had been centered at the time on trying to get a fish expert at the helm of the Bureau to guide it away from the rocks of commercialism and the whirlpool of politics. All threw up their hands when Senator Dill, key Democrat and a resident of the strategical center of the fishing industry, hoisted his political banner and passed the plum out to Mr. Bell.

Editor's Note: In the August 1935 NATURE MAGAZINE Mr. Finley wrote an article entitled, "Salmon or Kilowatts," explaining how the valuable fish runs of the Columbia River are threatened by the building of high dams. This article raises the question whether Commissioner Bell of the Bureau of Fisheries is guarding and conserving the fish resources intrusted to him.

Mr. Bell was frank in admitting that he was not a fish expert and had never belonged to any fisheries organization, either commercial or recreational. He said he accepted the position as head of the Bureau of Fisheries solely as an executive. He has served for over three years. Inasmuch as the future of some of our fish resources from both a commercial and a recreational standpoint depends upon the attitude and policy of the Commissioner, the records should be opened that the people may know the facts. They must demand sound conservation measures.

TOO BAD THE POOR FISH CAN'T DO THIS!
If dams could have fishways, there would be no objection to them

It is well known that lack of co-ordinating the work of federal departments is a primary difficulty in conserving our resources of land and water. The actions of one bureau often have nullified the efforts of another. Instances have been found where one bureau spent public funds in trying to conserve certain resources, while another destroyed them in wholesale numbers. At the present time one federal department is spending millions of dollars building high dams, while the records of the Bureau of Fisheries contain proof in abundance that this is the death knell of salmon runs worth many millions to our people.

The head of the Forest Service fights to prevent the destruction of federal forests. The Chief of the Biological Survey is continually waging battle to save the wildlife resources intrusted to his care. The salmon fisheries of California, Oregon, and Washington are rapidly slipping down hill. Who is fighting to prevent this loss?

When Mr. Bell accepted the position of United States Commissioner of Fisheries he was asked for a brief sketch of his achievements. According to custom this was published in "Who's Who in America." Among the accomplishments that he submitted were the following:

"Began as farmer in Grant Co., Wash., 1907; real estate business, Ephrata, Wash., 1910; apartment and hotel business, Seattle, 1912-18; County Commr., Grant Co., 1918-22; sec. to U. S. Senator Dill, 1922-33; apptd. U. S. Commr. of Fisheries, Apr. 15, 1933. Active in promoting irrigation projects, especially Columbia Basin Project."

As secretary to Senator Dill, it may be noted that Mr. Bell promoted the Columbia Basin Project, which centers in the building of the Grand Coulee Dam on the upper Columbia in eastern Washington. Largely through Senator Dill's influence, $61,000,000 was allotted to start the dam. The first plan specified a low dam for the production of power only, and could have been supplied with fishways. When the question as to who would buy the power in this wide unsettled area was raised, plans were changed to furnish water for both power and irrigation. Instead of a low dam the new plans called for one about four hundred and fifty feet high, which engineers state will require federal appropriations of $200,000,000 or more. Federal reclamation projects are always "meat" for the real estate speculators. When the work started on Grand Coulee it also started a boom in land values. All privately owned property in this arid unsettled area jumped in values.

The report that both Mr. Bell and ex-Senator Dill have large property interests in the Grand Coulee region has not been denied. Nor does Mr. Bell's record and his activity in irrigation and power projects contradict that

his real interests are in land and water promotion plans, and not in the conservation of fish resources. In view of this, should he remain the guiding hand in the United States Bureau of Fisheries?

At the National Convention of the Izaak Walton League of America, held in Chicago April 16-18, 1936, I contended that a high dam like the Grand Coulee would put an end to the runs of spring Chinook salmon that were accustomed to spawn in the headwaters of the Columbia. Mr. Bell replied: "We are going to have the dam anyway, and it is the duty of conservationists to work out the best schemes we can after the dam is built." This is the old policy of locking the barn door after the horse is stolen. Migrating runs of salmon must reach the spawning beds and the fingerlings must return safely to the sea, or the species dies.

Several years ago the question was raised as to how the government could protect its salmon resources when the power interests could barricade an important salmon stream with high dams. The Commissioner of Fisheries was given the important power of demanding proper fishways or other requirements needed to protect the fish before the project could proceed. If a strong fish expert had been at the head of the Bureau of Fisheries, some objection would have been raised to the plans for the Grand Coulee. But when Senator Dill obtained the appointment of Mr. Bell, any obstacles that the Bureau might have had were removed.

At the Chicago meeting Mr. Bell was frank in stating that it would be impossible to get any salmon over the Grand Coulee Dam but that money had been allotted to build a salmon hatchery at the base to conserve these fish. "I am one who believes that the dam in the Columbia River is not going to affect the salmon," said Mr. Bell.

This statement shows that the present Commissioner either is not familiar with, or that he ignores the past experience of the Bureau of Fisheries in trying to conserve the migrating runs of salmon. When a female spring Chinook salmon starts her long migration from the sea to headwaters to spawn, her life centers on this one ambition. She reaches the goal or dies fighting in the attempt.

On the tributaries of the Sacramento River in California, at Baker Lake in Washington, and on the tributaries of the upper Columbia the Bureau of Fisheries in past years had hatcheries where large numbers of salmon eggs were taken. In all of these regions the salmon runs have been exterminated because of power and irrigation dams. These egg-taking stations have been abandoned by the government. The salmon hatchery at Grand Coulee will be just another gesture to lock the barn door after the horse is gone. The building of the hatchery will be publicized. Later when the spawning salmon have disappeared it will be quietly abandoned to serve as another tombstone. There will be no death notice to inform the people of the tragedy.

Some people may take the stand that no one should retard the natural development of the country, and that our salmon resources are not as important as the production of electricity. On the other hand, there are in the West many rivers that are not salmon streams, where power can be produced. Years ago the California-Oregon Power Company completed plans to erect a two hundred and fifty foot dam on the lower reaches of the Klamath River in northern California. The State Fish & Game Commission claimed this as one of the few remaining salmon streams and that it was worth more for fish conservation than for power. A bill was initiated to stop the building of the dam. The people of California supported it by a majority of nearly two hundred thousand votes. Saving the Klamath salmon has not in any way stopped the development of this part of the country, since all the power that is now needed is produced.

Promoters are pushing plans to build more dams on the Columbia and to turn this big stream into a system of lakes to aid inland waterway transportation. This will change the whole biological character of the river and put an end to the salmon industry, which is worth $200,000,000, since it brings an annual $10,000,000 to the people. The question arises as to how long Mr. Bell can favor the building of high dams and at the same time head the United States Bureau of Fisheries established to conserve our fish resources. It is too much of a Dr. Jekyll and Mr. Hyde rôle. It seems to us that Mr. Bell is selling our salmon down the river.

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FOR HAWKS AND OWLS

THE accumulation of more information on the actual feeding habits of hawks and owls, and the fact that persecution of these picturesque and valuable birds seems to continue unabated, coincident with the decrease of the game birds that they are falsely accused of exterminating, has led to the publication of a second and revised edition of *Framing the Birds of Prey,* first issued by the Emergency Conservation Committee in December, 1929.

In addition to much information of a general nature that was given in the original pamphlet, which has been largely rewritten, the food habits of about twenty species of hawks and owls are given in some detail, the data being taken largely from the recent work of "The Hawks of North America," written by Dr. John B. May and published by the National Association of Audubon Societies. The earlier work by the Biological Survey, especially the extensive bulletin by A. K. Fisher entitled "The Hawks and Owls of the United States", which was the most important among the pioneer works written in defense of these splendid birds, is also freely drawn on. There are several half-tones.

Framing the Birds of Prey, being publication No. 55 of the Emergency Conservation Committee, can be obtained free, as long as the supply lasts, from Mrs. C. N. Edge, 734 Lexington Ave., New York City.

THE GREAT BLUE HERON

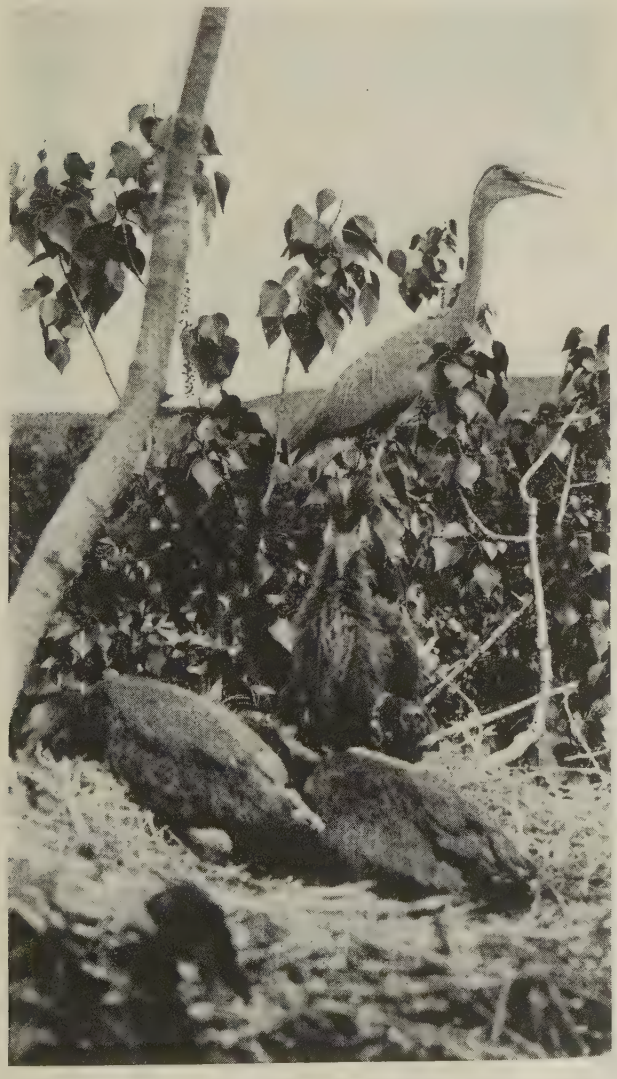
Another of the fish-eating birds condemned by prejudice, not evidence

By ELLSWORTH D. LUMLEY

Photographs by the Author

A GROUP of fishermen were seated on boxes and old chairs in the back of the taxidermist shop when I entered. Almost immediately I was asked, "Want to go with us next Sunday to a blue heron rookery and take a look at the stomachs of some of the birds we kill?" "Why, yes," I replied, "but why are you killing them?"

During the discussion that followed I learned that one of the fishermen had found this heronry of about 200 nests on Deep Creek. Fishing on this stream was not as good as the men thought it should be, so naturally the herons were to blame.



THE GREAT BLUE HERON POSES

At a distance they are graceful birds, usually wary and difficult of approach for close study. At the left, a parent bird with young in the nest

"There must be close to 400 of those danged birds eating the fish out of that stream," one of the men estimated. "I've heard they fly several miles to feeding grounds, so probably they are getting the trout in other streams."

"Not only are they destroying the fish, but the excrement about the nests is killing the trees," said the man who had found the colony.

I asked if they would meet again before Sunday to discuss this problem further. In the meantime, I said, I would gather all the information I could regarding the economic value of the birds. This they agreed to do.

I scoured bird books and reports from the Biological Survey for data on the food habits of the herons. I wrote to the late John Hooper Bowles of Tacoma, Washington, for his personal experiences with these birds. Everything that I was able to find indicated that herons were no menace to the sport of fishing. Poor fishing was invariably due to other causes often little understood. A few days later, when I presented this to the men, they were reluctant to accept the findings of investigators. It was

felt that conditions here were different than elsewhere. I had a partial victory, however, for they agreed to visit the rookery and kill and examine the stomachs of a few birds before the real "sport" of killing all of the herons was undertaken.

The following Sunday we drove to the bird city. I hadn't imagined that a colony of these birds could be so fascinating. The nests had been built in a grove of large cottonwoods, each tree having from three to a dozen nests scattered through its branches. More amazing than the many large nests were the birds themselves. Along streams and lakes I had always found the herons wary and hard to approach. When watched from a distance they had appeared stately, even graceful, as they stalked their prey. Now they were unafraid and their movements were awkward and ungainly as they flapped about through the tree tops. At our approach, the loud guttural cries of "Aawk, Aawk" from dozens of throats were almost deafening.

MANY NESTS IN THE ROOKERY

From the trees observers could look easily into many of the nests in the colony of herons

We climbed several trees, and thus could look into many nests, dozens of which, each containing four or five sky blue eggs, were examined. I could easily see why the men had planned to kill the herons. They were easy targets for a rifle as they soared above the trees. And they had not only planned to shoot all of the birds, but, also, to shoot through the bottom of each nest to insure complete extermination.

Three of the herons were killed, but an examination of their stomachs proved little. The men agreed that what we could identify were undoubtedly the remains of suckers. Only one tree in the group appeared to be dead and this one had been girdled by beavers. It was admitted that the trees were of no value anyway. I believe that most of the men were now willing to let the matter drop until more information could be gathered and a more complete study had been made of the birds.

My interest in the rookery was thoroughly aroused and I made regular visits to this large colony. Two weeks after my first visit the eggs were hatching, and what homely pot-bellied babes the young herons were. From the first they exhibited a quarrelsome pugnacious spirit that quickly reduced the number in a nest to only two or three. The larger crowded and threw the smaller out of the nests. They grew rapidly and within a few weeks those that remained showed great balancing skill in sidling out on branches whenever I approached the nests.

I heard little from the fishermen and finally concluded that they had given up the idea of killing the herons. Then a letter fell into my hands indicating that a few of the men were still determined to destroy this heronry. The letter was from the State Game Warden and was addressed to one of the fishermen. It said, in part:

"So far as this department is concerned, it is not necessary to have a permit to kill blue heron, as they are classed by our Commission as a predatory bird, and are protected by the Federal Government only. However, there is nothing in our law which would permit me to grant to anyone a permit to use a silencer. But so far as the extermination of the heron is concerned I should like to see them exterminated in some manner, because there is no question in my mind that they live exclusively on fish in this country, although they might be of some benefit in the South. They are certainly of no benefit to us here in the North."

By fair or foul means the herons were to be killed. Further discussion seemed useless. With the aid of another bird-lover, a Federal Game Protector was called into the case. His warning was sufficient to save the rookery.

During the past two years a large number of bird students have visited the heronry and have enjoyed one of the richest experiences in bird study. This rookery is aiding in awakening a true appreciation of the interesting environment in which we live and is offering the opportunity to teach the relationship that exists between fish-eating birds and game fish. Herons, like all animals, follow the path of least resistance in getting food and so take those fish that are most easily caught. These are the slow, coarse, non-game fish. By removing these competitive fish from our waters there is more food and shelter for game fish and a better opportunity for them to reproduce. Fishermen fail to remove the coarse fish because of their selective method of fishing, and too often thoughtless fishermen restock our streams and lakes with undesirable fish by throwing into the water what remains of their live bait. There is real need of the fish-eating birds in removing these competitive fish.

Herons also include in their diet such food as insects, crustaceans, frogs, snakes and rodents. The removal from fishing areas of such items as giant water bugs, larvae of predacious diving beetles, nymphs of dragon flies, crawfish and snakes is a decided aid to fish culture.

As a destroyer of mice, shrews, ground squirrels and gophers, the heron is an aid to the farmer.

The time will come when truths about our wildlife will replace the many falsehoods that today clutter the brain of man. When men learn to study and accept the results of scientific research, ruthless killing will cease to be carried on under the guise of conservation.

GO-GETTERS WHO ARE GETTING RESULTS

Nature lovers of western New York have seen the handwriting on the wall and are doing something about it. This group have incorporated themselves into the Nature Sanctuary Society of Western New York in an effort to save from extinction the disappearing fauna and flora of their section. Their membership is 100 strong

WANTED : MORE SANCTUARIES!

By HEATHER G. THORPE

We hear a great deal lately in the newspapers and magazines about conservation. Yet when most of it is all boiled down, those responsible for the movement seem to be interested merely that there should be more ducks spared this year to shoot at next. True conservationists will agree that this is no solution to the problem of how to save our fast-disappearing wildlife.

It was to save certain organisms from impending extinction that a group of Nature lovers of western New York State banded themselves into a corporation under the name of the Nature Sanctuary Society of Western New York. We would like to set forth our ideals and aims together with what we have accomplished, in the hope that others will follow us.

The corporation is limited by our constitution to one hundred members, each of whom pays a five-dollar charter fee and one dollar a year dues. With the money thus obtained we buy property in order to preserve the wildlife thereon. Our first real estate venture, two years ago, resulted in the acquisition of a twenty-six acre true northern sphagnum bog, filled with pitcher plants, sundews, buckbean, swamp saxifrage and loosestrife, bog laurel, leather leaf, cotton grass and other bog-inhabiting plants. The surrounding woods contain moccasin flowers (alas, only too few are left), white pine, mountain holly, nannyberry, graceful royal and cinnamon ferns, a beautiful stand of sugar maple, to say nothing of many other species of flowering plants and mosses. The constitution of our corporation forbids the uprooting or removal of any of the life found on our property for any purpose whatever without written permission, and in this way we hope to keep all these unusual types growing there as well as to encourage others to come in.

The bog is a delightful place to visit and part of our program includes field trips and picnics to our bog, at which time members bring their families and friends. The bog has reached the mature stage where there is no longer open water in the center. To walk on the flooring of sphagnum moss gives one much the same sensation as when bouncing on a feather bed, though, of course, rubber boots are needed in the bog. Many of our people had never had this experience before and had looked forward to it with something of dread, their minds filled with stories of quagmires and bog holes. They were agreeably surprised that, aside from wet feet, no further discomfort need be feared.

Almost our first act after acquiring the bog was to post it according to law. Numbered among our membership are many able-bodied men whose interest was manifested in the work they did to drive the heavy iron stakes into the ground and bolt on our signs. It was a proud day when this was completed and we made something of a festivity out of it. We were also most fortunate in having good neighbors, farmers whose property adjoined, so that

a right-of-way was procured over their land into our property, and their aid and co-operation secured in keeping out intruders.

Nor have we been lax in learning the natural history of this property, which is known as the East Concord Bog and is situated about thirty miles south of Buffalo, New York. As soon as possible after buying it, we made our first field trip there together to study the geological origin as well as the flora and fauna of a typical northern bog. Before we are through we expect to make a thorough survey of the organisms to be found there. For this and other fascinating trips which followed we are indebted to Professor William P. Alexander, of the staff of the Buffalo Museum of Science, who is one of our members and to whom credit for the idea of forming such a society belongs. It was largely due to his enthusiasm and inspiration that one hundred interested people were quickly found.

Naturally, among one hundred members various hobbies and interests are represented. We have some active ornithologists who have secured for the bog a large automatic bird-feeding station and have placed it out there. Periodic trips are made to see that the hopper is kept full and in good working order.

During the winter months the interest of the group is kept up by social meetings at which we have illustrated talks by our members whose varied interests make a well-rounded program. During the two years of our existence as a corporation, we have been very busy with details. As most readers are well aware, the details of purchase with its items of title search, rights-of-way, deed, etc., are quite intricate and it is only quite recently that we have had much time for anything else in our indoor meetings.

We enter upon our third year with only two vacancies in our membership and already have a waiting list more than enough to fill these places. Our treasury is in a satisfactory condition and we expect to buy another piece of property this year. The lands that we acquire are usually quite worthless to the farmer and consequently inexpensive. In this we are fortunate for our funds are limited.

The need for such a sanctuary cannot be overestimated. Botanists in our group tell us that fifteen years ago East Concord Bog was a paradise for orchids. Among them the snake mouth, grass pink, yellow and showy lady's slippers, pink moccasin flowers and white fringed orchis grew in such profusion that the sphagnum of the bog could scarcely be seen. About a quarter of an acre of cardinal flowers grew there also. The latter have disappeared because of several rainy seasons, but the disappearance of the former is due to the ravages of "orchid-snatchers". In the bog today there are occasional pink moccasin flowers growing under the fringing white pines and some purple fringed orchis, but to date few of the others have been found. This, then, is our aim: to replace what we can and otherwise to allow Nature to take its course without any interference from man. How many hundreds of other places are crying for such protection!

Our corporation hopes that it will be an example to others in the United States and Canada. The governments of these two countries are doing splendid work in their national parks and preserves. The success of state, provincial and county parks is evidenced by the constantly increasing stream of visitors to them each year. But there is also a great need for groups such as ours to get together to preserve nearby small localities with which they are familiar.

The Nature Sanctuary Society salutes all such and hopes to hear of your success!

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MOTION PICTURE LECTURE ★ ★

A dramatic motion picture lecture, "Woods, Waters and Wildlife," will be given throughout the country next winter by William L. Finley, Field Naturalist for the American Nature Association.

A leader in the conservation of our wildlife resources, Mr. Finley has been associated with Mr. Pack in many of the field expeditions under the auspices of the American Nature Association. "Bill" Finley is well known as the foremost of wildlife photographers in this country, with an experience of more than 30 years in many fields from Alaska to the Mexican border. He is one of the vice-presidents of the Izaak Walton League of America, and occupies the same position in the newly organized General Wildlife Federation.

WILLIAM L. FINLEY

Jay N. Darling says that Mr. Finley has succeeded in dramatizing North American wildlife better than anyone else. Through his motion pictures and lectures, he has given a tremendous stimulus to wildlife conservation.

In all parts of the country there is an earnest effort in the conservation movement among Junior Chambers of Commerce, Women's Clubs, Boys' and Girls' Scouts, Audubon Societies, Izaak Walton Leagues, and other groups.

All who are interested in the formation of various state Wildlife Federations will find Mr. Finley's motion picture lecture an important drawing card for any meetings that are held, and one that will help the cause.

Further information regarding these lectures can be secured by writing the Conservation Department of Nature Magazine, 1214 Sixteenth Street, N.W., Washington, D. C.

A THIRD ★★ DUCK STAMP

With the announcement that another Federal Duck Stamp is in the mill, prior to any public announcement of the conditions to be imposed on waterfowl during the next hunting season, the inherent iniquity of this particular phase of so-called conservation is again thrust upon us.

The federal duck stamp is required to be carried by every person over sixteen years old who hunts migratory waterfowl. It costs one dollar. Ninety percent of this goes into waterfowl refuges; ten percent is for administration. At first this doesn't sound iniquitous, but we still do not like it, and our objections are based on a rather full knowledge of its genesis and development. These objections may be stated briefly as follows:

1. It is not reasonable to assume that, by the expenditure of the dollar received from each hunter annually, enough waterfowl to offset the number killed by that hunter during the open season can be saved or produced.

2. The mere fact that each hunter has paid one dollar tends to prevent restrictive legislation, and especially closing of the season.

The duck stamp is the natural child of the one-dollar federal tax whose adoption was strenuously agitated for several years, beginning more than a dozen years ago. This old public shooting ground idea was finally squelched, and properly so. But its proponents never buried the germ of the idea, and when Congress failed to honor its obligation to appropriate the continuing annual sums authorized for the entirely beneficent migratory-bird conservation act, which was passed in 1929, the Federal license idea was revived. It was again opposed by a variety of interests: some objected to any federal license; some favored other methods of taxation; a few saw its inadequacy and its inherent danger. But the duck stamp was authorized by law in March, 1934.

Even before the bill was passed the suspicions of those who feared that it would forestall restrictive legislation were amply justified. A month before the bill passed a prominent eastern sporting editor urged its passage: "Then the duck shooters of this country can demand their rights on the basis that they are going to put up the money to buy nesting, resting and feeding grounds. **** If every man who reads this editorial will write his representative at Washington at once and get his friends to do likewise, there will be no closed season on ducks next year."

Apparently he and his friends wrote. The bill was passed and there has been no closed season since, neither has there been any restrictive legislation that was adequate to check the decline of the ducks and geese. And it was confidently and exultingly claimed by some, who favored continued killing at any cost, that but for the stamp the waterfowl season would have been closed. Furthermore, the Biological Survey, a few days after officially announcing the first stamp in early July, 1934, virtually promised that open seasons would be continued from year to year.

This promise was in effect confirmed late in December of the same year, months before the results of the notoriously destructive staggered season of 1934 could be gauged, when the Survey announced plans for the second stamp in the series. This, of course, was a warning to the conservationists, and an assurance to the gunners, that an open season on waterfowl was contemplated. And the ducks and geese again suffered in 1935 despite a widespread demand for a closed season, voiced by many thousands of conservationists, including many far-seeing sportsmen in all sections of the United States.

Now, in mid-summer of 1936, we are informed that the third duck stamp is on the way. This shows three Canada geese as the supposed recipients of the bounty that results from the sale of these stamps. The previous stamps pictured mallards and canvasbacks, respectively.

It is unlikely that either the harm or the benefit caused by the waterfowl hunting stamp can ever be computed and balanced exactly. Each year it yields a few hundred thousand dollars, to be expended on the slow process of improving a part of the breeding grounds of not more than fifteen percent of our diminished waterfowl, the part that breed in the drained and drought-racked marshes of the United States. Each year the buyers of the stamps kill as many ducks and geese as possible from the total supply. All the waterfowl species are diminishing, and several are depleted to a point that threatens extinction in a few years if killing continues.

But the killing seasons go on. Each year witnesses an effort to convince the non-shooting public that the birds have increased, and an open season is justified. But since no figures either of waterfowl population or kill are available for the computation, the effort each year becomes more pitiful. Meanwhile the drifting straws of minor restrictive measures—lower bag limits, exemption of certain species, partial stopping of baiting, elimination of live decoys—point to the hurricane of impending extermination.

When the story of the influences that are withholding from the waterfowl the protection they need is told, it will be a sorry one. We wonder if those responsible ever consider what their sport costs the rest of us.

WEST VIRGINIA WILD LIFE

We gather from the biennial report (1934-35) of the West Virginia Conservation Commission that it has difficulty in maintaining its supply of game and fish. The state has nearly 161,000 resident and non-resident sportsmen, and 85 local sportsmen's organizations. It has tried artificial rearing of game birds but finds this method to be impracticable. It has purchased and distributed deer, rabbits, raccoons, beavers, turkeys, pheasants and quail.

In common with many states, West Virginia pays some attention to the destruction of its "vermin". The reasons for encouraging this destruction, and the numbers of the different species killed, appear in the following quotation, pages 28-29:

"Predatory birds, animals and reptiles destroy more fish, small game, and song and insectivorous birds in the course of a year than do all the hunters and fishermen combined. If our game population is to be maintained and increased, it is obvious that predators must be reduced in number and the vermin population held in check.

"To this end, game wardens destroy all predators possible while on patrol.

"The Commission pays a bounty of $2.50 per wildcat killed, and intends increasing this bounty to $3.50.

"Sportsmen's organizations of many counties have carried on vermin control contests, offering many substantial prizes for largest number of vermin eradicated.

"These contests have resulted during the biennium in the elimination of thousands of predatory vermin as indicated in the tabulations below set forth.

"The following vermin were included in the various vermin-killing contests, with the following numbers of each species killed and accounted for:

1933-34

	Pieces of Vermin
Hawks	3,007
Hunting House Cats	1,892
Snakes	79,481
Water Dogs	13,497
Crows	9,438
Weasels	1,430
Grey Fox	1,451
Turtles	15,370
Kingfishers	1,030
Rats and Mice	34,475
Garfish	87
Terrapins	4,417
Mink	321
German Carp	59
Red Squirrels	399
Chipmunks	18,089
Owls	954
Starlings	3,985
Wild Cats	311
Timber Wolf	1
English Sparrow	1,907
Total	191,511

We must leave the reader to wonder what species of game animals and fishes are benefited by the deaths of some of the lowly creatures enumerated in this table. Might not some of the hawks, owls and snakes have destroyed some of the other victims of these contests, had they been permitted to live? Could not some of the water dogs have eaten the spawn of some of the enemies of trout? Perhaps some of the owls might have eaten mice instead of quail, had they lived. And what kind of game is prevented from surviving by the chipmunk? These and many other questions will occur to the thoughtful student.

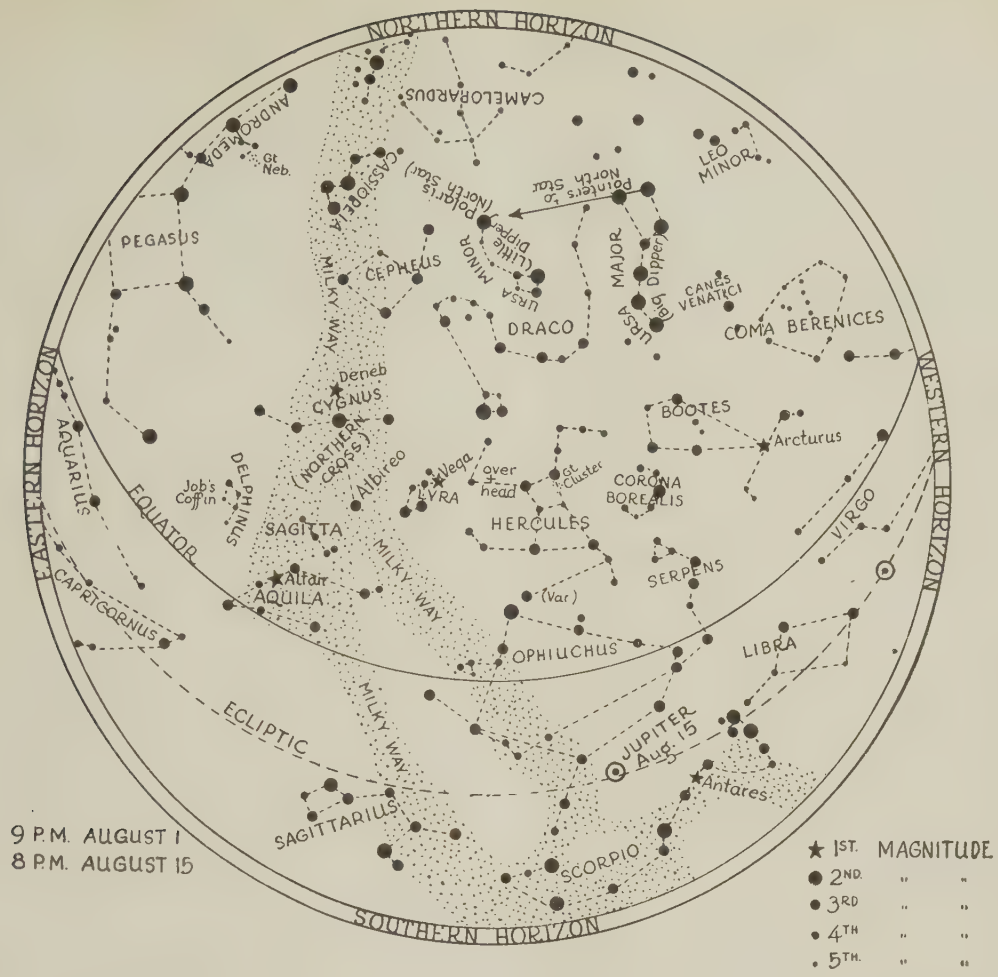
These are only a few of the questions that call to us for answers every time we see a list of "vermin" killed as a result of such contests. While we do not question the wisdom of destroying certain species under circumstances that indicate with certainty their harmful influence, we most earnestly deplore the tendency to conduct hunting contests that have for their object the indiscriminate killing of a great variety of wild creatures, in advance of authoritative studies of their habits. The interrelations of the myriad members of our fauna are too intricate to justify their wholesale destruction by a minority interested only in game species, and, at that, interested only in killing them. The assumption that predatory species effect more destruction than all hunters and fishermen has never been proven. The further assumption that a long list of mammals, birds and reptiles can be justifiably destroyed without a hearing, and with benefit to the remaining fauna, has been found to be fallacious by the experience of other communities in hundreds of cases.

DWINDLING FUR ANIMALS

A five-year breathing spell for the marten, fisher, wolverine, and otter, now existing mainly in a few of our northern and mountain states, to save them from joining the list of extinct wild animals, is urged by Ira N. Gabrielson, Chief of the U. S. Bureau of Biological Survey. He says these fur animals may share the fate of the passenger pigeon, the heath hen, the Maine giant mink, and other extinct species, unless the hunting and trapping season on them is closed for five years. He has asked game and conservation officials in states where these animals still live to provide a five-year closed season on them.

"Several states have laws providing closed seasons on these animals, but broader protection is needed," says Mr. Gabrielson. "These fur-bearers never were very abundant and their pelts always have sold at prices high enough to cause close trapping. They have disappeared entirely from much of their former range."

It may not be generally known that all these species need protection in Canada nearly as much as in our own country. The vast forests and barrens of the North, originally so plentifully supplied with these and other valuable fur-bearers that for generations Canada was known as the "Fur Countries", have been trapped so ruthlessly since the advent of high prices and easy transportation that the marten and fisher, particularly, are becoming dangerously scarce. Animals north of 49° need help also. E. A. P.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

A New Asteroid Approaches the Earth

By ISABEL M. LEWIS

Almost remarkable little body was discovered on February 12 of this year by Dr. E. Delporte of Uccle, Belgium. Next to our moon it comes closer to the earth than any other known object. On February 7, as a calculation of its orbit later revealed, it was at its nearest point of approach to the earth and was then at a distance of only 1,300,000 miles. This was only slightly less, however, than the least distance of Lexell's Comet of 1770 which came within 1,400,000 miles of the earth.

The name of Anteros, "Rival of Eros", has been given to his latest discovery by Dr. Delporte, who in 1932 also discovered another remarkable celestial body known at first as The Delporte Object, or Planet 1932 EA, but later called Amor. Both of these little planets, or asteroids, are exceptional bodies. The closest approach of Amor to the earth is about ten million miles but it does not come inside of the earth's orbit. The tiny Anteros on the other hand comes inside of the orbit of Venus and within nearly forty million miles of the sun. It is probably the smallest object in the solar system to have its orbit calculated and observed in its journey around the sun. Its size has been estimated from its brightness as compared with that of the largest asteroids, Ceres and Juno, and it is very probable that it is not more than a quarter of a mile in diameter. It is doubtful if any asteroid has ever been observed smaller than this object. At the time of its discovery it was of the 13th magnitude or about equal to the planet Pluto in brightness but it then was rapidly receding from the earth and decreasing in brightness. To obtain a good orbit for it and so keep it from being lost in the heavens it was important that its position be determined on as many different dates as possible with large telescopes. Fortunately, such observations were made at Lick, Yerkes, Mt. Wilson and elsewhere. One

of the last observations of the asteroid was made on April 11 at Mt. Wilson, photographically, when it was of the 20½ magnitude, which is very close to the limit of visibility of the great 100-inch reflector. It was then beyond the orbit of Mars. In April, 1937, it will be at aphelion, or at that point in its orbit farthest from the sun, and will then start on its return trip. Its period of revolution around the sun is about 2½ years so it is due to return to the sun in the summer of 1938. By that time all of the observations of its positions probably will have been utilized in computing an excellent position for Anteros. Anteros received its name because it comes closer to the earth and is a smaller asteroid than the famous little asteroid, Eros, which at the time of its discovery in 1898 came closer to our planet than any other asteroid known at that time. At its nearest possible approach Eros comes within fourteen million miles of the earth. There was a close approach of Eros to the earth in 1931 when it was distant only sixteen million miles. Eros is about twenty miles in diameter and when nearest the earth it is as bright as a star of the seventh magnitude and visible even in a field glass. A strange thing about Eros is its remarkable fluctuations in brightness which it is believed are due to its rotation on its axis. At the Union Observatory of South Africa, Eros has been noted, with a 26-inch telescope, to have the form of a figure eight, suggesting it may be made up of two closely revolving bodies.

The first Delporte object, Amor, has also shown a remarkable change in brightness. After its discovery it was observed to fade rapidly in brightness at a time when it was approaching the earth and sun and would be expected to become brighter. Amor has a period of 2¾ years and as it also makes a close approach to Eros it is suspected that the two asteroids may have a common origin.

A fourth remarkable asteroid that has been discovered in recent years, and one which also comes close to the earth, is known as the Reinmuth object. It was discovered by Reinmuth at Heidelberg in April, 1932, only a few weeks after the discovery of Amor. It also comes inside of the orbit of Venus when nearest the sun and approaches within two million miles of the earth. It was, until the discovery of Anteros, the nearest of all the asteroids. Unless a number of observations are made of these tiny objects at each return to the sun they are very apt to be lost. When they approach near the large planets, as they frequently do, the gravitational attractions of them greatly change the shape and position of their orbits. The large number of observations that have been obtained this spring of the asteroid now known as Anteros should make it possible to find it again at its next approach to the sun if it is at all favorably placed with respect to the earth. One advantage of the observations of these small planets that come close to the earth is that they furnish a very accurate method for determining the distance of the earth from the sun, which is the yardstick for measurement of distance in the solar system, and the mass of the larger bodies that perturb them.

So close does Anteros come to the earth that one may wonder at possibilities of an actual collision between the earth and some such small body. The chances of such an encounter are extremely small. There is evidence, however, that encounters between the earth and meteorites weighing a number of tons have occurred at rare intervals.

According to Professor C. C. Wylie of the University of Iowa, the number of falls of meteors weighing fifty tons or more is about every thirty years for the land surface of the world, while the number of meteors great enough to produce craters, such as Meteor Crater in Arizona, or to bring about local destruction on the surface of the earth, such as was caused by the Great Siberian Meteorite of 1908, would be about one in 150 years for the land surface of the earth. Small meteors, such as would be readily seen with the naked eye, are estimated to total about twenty-four million a day for the world. If these estimates are anywhere near the truth, it is evident that our planet is undergoing a continuous bombardment by countless particles of meteoric dust that, were it not for the presence of an atmosphere, would fall to the surface instead of being largely consumed by friction.

This month, it may be recalled, the periodic shower of the Perseids is due with its maximum display in the early morning hours about August 11. Perseids may be seen in greater or less numbers, however, from the latter part of July to the middle of August. When the moon is not above the horizon the chances of observing the Perseids in considerable numbers are greatly increased. As the moon will not rise until after midnight at the time of maximum display, the Perseids may be seen to the best advantage around midnight on that date.

Venus is now in the western sky and may be seen for a short time low in the west at sunset. Mercury also is in the evening sky in August but will not be favorably placed for observation until the last few days of the month.

Mars is now visible in the morning sky in Cancer and rises about two hours before the sun the latter part of August.

Jupiter is above the horizon most of the night and may be seen in the east at sunset a few degrees northeast of Antares in Scorpio.

Saturn is in Aquarius and rises soon after sunset and is visible all night.

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Trailside Treasures

THE MYSTERY CLEARED

By JANE ADAMS PARKER

GRANDPA Arnold and Jerry hurried after the dog, as it bounded through the woods. As they reached Willow Stream the whistle came again, and the dog plunged into the water and swam across.

"Come on," said Grandpa Arnold, "we'll have to cross over on the rocks. But go carefully."

Hardly had they reached the other side when two boys came out of the woods and called the dog to them.

"Hello!" said Jerry. "This is Tommy Higgins, Grandpa, and this is Johnny Barlow."

"And this is my dog Prince," said Johnny, patting the shaggy head. "I thought sure he was lost."

"Our old cat got lost in Peterson's woods," said Tommy. "She had baby kittens. They were so tiny we couldn't raise them. My sister almost cried her eyes out."

TWO BOYS CAME OUT OF THE WOODS AND CALLED THE DOG TO THEM

Grandpa Arnold looked at the boys thoughtfully a moment. "Some weeks ago, someone shot a mother robin, with a sling shot," he said slowly. "She had some tiny babies too. They would have starved, only Jerry found them and brought them home."

"Yep," said Jerry proudly. "And now they're almost ready to fly."

"I shot that robin," Tommy said quickly. "But I did it just to see if I could hit her. I never thought she might have a nest full of young birds. Then one day I cut across behind your garage and heard Jerry telling Jackie about them. It made me feel sorry—"

"Is this your knife?" Jerry asked, holding out the one he had found.

"Oh good!" said Tommy. "Where'd you find it?"

"Come on and we'll show you." As he spoke Grandpa Arnold turned on his heel and started back through the woods, the three boys straggling after him.

Aunt Dot, Jo and Rosy were gathered about Jackie's chair, looking at the open box on his knees.

"These are the little Treasure Hunters," said Grandpa. "They go down the Old Trail and hunt for treasures to take back to Treasure House. And Jackie is the only one who shoots the wild things." Into Grandpa's blue eyes stole a merry twinkle, as he looked around at the astonished faces of the little hunters.

"Oh I know," Jackie burst out gaily. "I shoot them with my camera. And that's all right."

"After all it's lots more fun," said Grandpa

Arnold, when the children had stopped laughing so he could talk, "and it's the only thing anyone ever should use to shoot our little wild friends."

For a long moment no one spoke. Then Aunt Dot took up three small white eggs, speckled with light red and brown. "These are the barn swallow's eggs," she said. "Someone must have robbed a nest up in the Old Mill across Willow Stream. The birds come there every year and have two and sometimes three broods a summer. How carefully those little parents build their nests! From the outside they look like mud cups, but inside they are lined with softest feathers and dried grass or straw. You'll find them lying flat on the broad rafters, or stuck against the side wall like a lamp-bracket. Often the English sparrows tear the nests to pieces to get out the materials for their own nests. Sometimes a great cat will pounce on one of the parent birds, as it darts close to the ground after a moth or beetle for its babies' dinner. It's hard being a little bird when so many things are just waiting to catch you. Now would be about time for one brood to hatch out. We might have had some good sport watching the old birds coax the babies to fly from the nest to a branch close to the window ledge. I wonder sometimes if those little parents aren't very, very proud to see their babies fly out for the first time—"

"When I was a boy," went on Grandpa Arnold, "I used to lie on the grass and watch the gleaming backs of the swallows as they skimmed through the air. The male bird's laughing song seemed to brighten up the whole outdoors."

"And these little birdies will never sing now," said Rosy again.

"Oh shucks," said Johnny, "we'll put all the eggs right back."

"No," said Grandpa, "these eggs are spoiled."

"Mr. Arnold," said Tommy, "could we come treasure hunting with the others sometimes?"

"Well, I guess we'll have to think that one over for a while," said Grandpa, slowly.

"Listen!" Jerry suddenly made a dash up the Old Trail, calling back over his shoulder, "I hear someone. And I know who it is too."

(To be continued)

What do you think? Should the Treasure Hunters let the two boys join them on their trips? Uncle Dick would be glad to have you send in your vote, yes or no. Maybe you would like to give your reason in just a few short lines. Then watch the September story and see what the Treasure Hunters decide.

•

BUNNY AND DAN

By EVA H. FISHER

Illustrated by Jo Fisher

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ONE DAY a little girl, playing on a hillside, came across what had been a rabbit's nest in a hollow at the base of a tree. The nest had been destroyed. Suddenly the little girl thought that there might be a little rabbit back in the nest. So she ran her hand into the hollow and there, away back, was a bunch of dry grass. This she pulled out, and in it was the tiniest bit of a rabbit, not more than two days old.

She ran to the house to show what she had found. Of course, her mother said, it must be cared for, but how were they to feed such a wee thing and keep it warm? A medicine dropper was used for a day or two, and then dolls' nursing bottles. It took greedily to the bottle, all the while patting the hand that held it with its little front paws.

In the house was a large, beautiful cat named Dan. He was sleeping when the little girl laid the bunny beside him, but he raised his head and looked wonderingly at the mite. Bunny, feeling the warmth of his body, was already snuggling into Dan's hair. He decided to let it stay, stretched out and went to sleep again. And so Dan kept it warm during the days, while at night it was put into a box with a heated iron, the whole covered over with a piece of blanket.

One night, while Bunny was still small, it climbed up the side of its box and fell out. It was scared and shrieked wildly, while poor Dan tried to comfort it. He patted and nosed it until it was calm, and put it back in its bed.

As Bunny grew it played all around the rooms and on the large back porch, where it had nooks made of cardboard boxes in which to hide. But it

thought one door was not sufficient, so it always cut another with its sharp teeth. It also had on the porch large sods of grass and moss in which it could dig to its heart's content.

One day the little girl took it down onto the grass, thinking it would like to see the great outdoors. Bunny was terrified at the vastness of the world and just quivered and trembled.

Bunny's ambition in life was to be one of the family, and not just a little bunny. It always knew when mealtime was drawing near. Then its favorite place to sit was on the lower shelf of a small table in the dining room. From there it could watch for its green food to be spread on a paper in the corner. As soon as it saw that the food was ready it hopped down and ran to it, but it never touched a bite until it saw the family begin to eat.

While Bunny loved Dan, it was jealous of him. It showed this when Dan sat down close to the little girl or her mother. Bunny would run at him with a funny little barking sound trying to send him away. It chased Dan round and round the room in the belief that it was frightening this great cat. Dan pretended to be very much afraid.

Bunny grew to be a strong, healthy little rabbit, but because it was brought up in the house, it never became as large as those of the outdoors. However, it was always contented and happy with its playmate, Dan.

Animal Engineers

By CLARENCE M. WEED

THE BEAVER is the great engineer of the animal world. With teeth, feet and tail for tools he builds houses, digs canals and changes running streams into quiet ponds. In all this he shows marvellous instinct and intelligence. The building of dams in small streams is the chief engineering feat of the beaver. The beavers select the site of the dam, cut down trees, trim off the branches, cut the fallen trunks into sticks a few feet long and float them to the selected site. Here they help one another to build the dam. They line the upstream side of it to make it water-tight. Thus the water is held back to make a pond in which the animals build their home.

The beavers show intelligence not only in building their dams and houses. They are also wise in watching the stream after their dam is built. When the waters rise too high and threaten to overflow or break down the dam the beavers tear away a part of it to let the water through. The beaver houses are built of sections of tree trunks or branches plastered together. Inside each house one or more rooms are made just above the water level. In winter the beavers live in these rooms most of the time. The beaver family would not be safe in winter if the top of the house could be torn apart by wildcats or other enemies, so just before the freezing weather arrives the beavers plaster their home with thick layers of mud. The mud freezes solid and their house is secure from any of the forest enemies.

Nature Magazine in School

A Department of Aid to the Teacher

Pollen

Since ragweed is one of the most frequent causes of hay fever, its eradication from urban areas at least should be undertaken. It would be possible to have a campaign for its extermination. Clubs could enlist the services of children of a community. Prizes could be offered for the largest collections of plants destroyed. The number of plants could be determined by measuring freshly picked plants in bushel baskets. This procedure would expedite the measuring and ensure the correct identification of the plants submitted.

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Strange Sights in New Mexico

This story of an expedition into New Mexico shares with the reader the thrill of discovery. It raises the interesting problem of cave ice, a phenomenon found in many sections of the country both east and west. Anyone having the opportunity to explore such a cave would find it interesting to note the kind of rock formation and the general shape of the cave. Lava, the formation in which this ice usually occurs, is a poor conductor of heat. It is thought that the vertical cross section of these caves is such that the far recesses are on a lower level than the entrance thereby causing the general direction of air currents to be into the cave in winter and out from it in summer. Often such caves are found in rock that contains numerous connecting passages, permitting the free circulation of air in winter after the ice has melted somewhat and so facilitating the reestablishment of freezing conditions.

●

Hemerocallis—The Dependable Day Lily

The day lily is surely intended for the inexperienced gardener since it will grow under almost any condition of soil or exposure with very uncertain care. It is an especially desirable flower for a child's garden. By following the directions given in this article, an adult can easily assist a child in planting a few lilies in his small plot.

Perhaps there is nothing that unites the interests of a family more than working together on projects such as gardening. In consequence, if a child can have some part in the building of architectural features or of planting that garden that belongs to his father and mother, his subsequent interest and pride in gardens will be (enhanced). From the child's point of view one of the most interesting features in a garden is the pool. This can be made the center of attraction for a wider variety of plants and animals if it is surrounded with an area of marsh. This can be accomplished by making two walls around the pool, one inside the other, the outer wall enclosing the marsh and the inner one, the pool. Among the plants that enhance the charm of this marginal planting, lilies are foremost.

In order that teachers and parents may further use Nature Magazine as an aid to the study of Nature and Science, this page is devoted to the following brief notes based upon articles in this issue and suggesting ways in which they may be used as a source of inspiration and information. To bring these Nature study thoughts to our readers we have obtained the services of one eminently qualified for the task, and this department is edited

BY ESTHER SCOTT

Instructor in charge of Elementary Science Washington, D. C., Schools

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The White-Marked Tussock Moth

This is one of the most common of our insects found from Maine to Texas. Its striking markings so well described in this article make it easy of identification and in spite of its appearance it is quite harmless to man. Its life history is rather typical of many other insects. For these reasons it is an especially appropriate species for children to study. Adult moths, eggs or cocoons may be collected and kept in an insect cage. The eggs may be placed in a closed box until these hatch. When the caterpillars emerge these should be placed in the insect cage and fed leaves of the same species as the tree from which they were originally taken. If these leaves are placed in a jar of water, the labor of supplying fresh ones will be greatly reduced. The danger of drowning the caterpillars will be overcome by covering the top of the jar with a paper cap and inserting the stems or twig through a hole in the paper.

A collection of tussock moth cocoons might yield one or more parasites and it would be interesting to watch the life cycle by keeping these insects also in the cage.

As the summer advances a collection of egg masses and cocoons of many species of insects would be a very acceptable gift for a child to make to his school. This collection should be kept out of doors where it will be moist, or else dampened occasionally.

●

Strip Crops Hold Soil When Wind Whips Field

Strip cropping, one of the best and most economical methods of checking erosion by water, also is valuable in checking wind erosion.

Whether planted on contour lines or at right angles to prevailing winds, strips of sweet clover, alfalfa, sorghum, sudan grass, or sunflowers not only stop soil that starts to blow, but also break the wind as it sweeps across the field. It is small soil particles carried by a high wind that produce the scouring effect known as wind erosion. Strip cropping stops drifting soil in the same way as fences and weed clumps.

Another advantage of strip cropping is that strips may be shifted from year to year.

Wanted: More Wild Life Sanctuaries

In the midst of the destruction of our wildlife, it is encouraging to read the story of the development of the Nature Sanctuary of New York State. It marks a definite step in the direction in which many people in other sections of the country are thinking. Camp leaders could present the work of this organization to their young people and form junior clubs along these lines. Groups of young people in rural sections could combine to form such a society and pledge themselves to protect the wildlife on their own and on each other's places.

●

The Puffins of Machias Seal Rock

Not all of the readers of NATURE MAGAZINE or their families will have the opportunity to see this bird in its native habitat either on this side of the Atlantic or in the British Isles. It nevertheless presents some interesting problems. The bodily structure of this bird is unusual. Of special note are: the fold of skin at the inner angle of the eye, which gives the bird such a peculiar expression and the bill which changes its markings at the approach of winter.

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Wild Life Committee Reorganized

The Committee on Wild Life of the Division of Biology and Agriculture of the National Research Council has been reorganized. The personnel of the present Committee follows: H. E. Anthony, Chairman, C. C. Adams, Henry I. Baldwin, R. E. Coker, William S. Cooper, Herbert C. Hanson, G. E. Nichols, E. A. Preble and A. H. Wright.

The intimate relation that exists between wild creatures and our civilization is emphasized by modern developments, in that the encroachments of agricultural and industrial interests have resulted in a continuing diminution of the areas available as natural habitats. As an example, there is the all-too-prevalent practice of governmental and other agencies of "cleaning up" natural areas in their emergency projects. Other demands of increasing human populations are continually exacting a greater toll on our birds and other wild creatures. The danger of their over-exploitation by the devotees of sport, with its commercial accompaniments, is particularly serious. Recognizing these facts, the Division considered it best to reflect the need for permanent preservation of habitats in the title of the Committee, which now becomes "Committee on Wild Life and Nature Reserves."

It is the earnest hope of the officers of the Division of Biology and Research that the studies of the newly appointed Committee will help to rally the forces favoring the permanent reservation of important natural areas, in an effort to counteract, as far as may be, the harmful effects of unwise drainage, the destruction of the vegetative cover of natural habitats, and the undue exploitation of our native wild animals and plants by sport and commercialism.

Garden Lectures

Bradford Williams announces a new series of illustrated garden talks. His subjects will be: "Six Tests of Garden Design," a lecture on garden planning of special interest to the small gardener; "The Romance of Gore Place," a lecture on the restoration of this historic old countryseat near Boston; "A Garden in Danger: The English Countryside," showing the charm of the English shore and countryside from the Lake district in the north to the western country of Devon and Cornwall, and "Preservation of Beautiful and Historic Places," the story of the work and accomplishments of The Massachusetts Trustees, a private corporation founded in 1891 for the purpose of preserving beauty spots of the state. Terms and dates of the speaking engagements can be obtained from Mr. Williams, a fellow of the American Society of Landscape Architects, at 9 Park Street, Boston.

Biology Textbook

A new textbook, entitled *College Biology,* has been prepared by Walter H. Wellhouse and George O. Hendrickson, respectively professor of biology and assistant professor of zoology at Iowa State College. The volume, priced at $3.00, is available from the publishers, F. S. Croft and Company, New York.

Speeches for Every Occasion

More Speeches and Stories for Every Occasion, a 500-page volume by A. C. Edgerton, is available from the publishers, Noble and Noble, New York, for $2.00.

Dogs, Cats and Monkeys

An interesting book with the above title, compiled from the writings of the late René Bache, well known popular science writer, and edited by Violet Biddle, sets forth the author's ideas on the ancestry, moods and possible thinking processes of these three animals. The volume is available from Dorrance and Company, Philadelphia, for $1.25.

Hedge Folk

Everyone interested in Nature will enjoy *Hedge Folk in the Twilight* by Phyllis Kelway. The author has built miniature spinneys for dormice, bramble patches for shrews and has reached a state of something approaching intimacy with hedgehogs. Of these creatures and others of England's countryside she writes, showing them as her friends. The volume is published by Longmans-Green and Company, New York and is priced at $2.50.

Flower Book for Children

Flower Folk, by Anne Guthrie Bicknell, is the child's own flower book, in which the author transfers to the young mind her own love of flowers and gardens. The book is beautifully illustrated in five colors by Martina Grenwis and is available from G. P. Putnam's Sons, New York, for $2.00.

Nature Guiding

All those who are planning an extended Nature trip will be interested in *Nature Guiding on Wheels,* by William G. Vinal, professor of Nature Education, Western Reserve University. "The Nature Guide School on Wheels" was the name of a three-weeks bus trip sponsored last summer by that University's School of Education. Twenty-five teachers of elementary science banded together to study the Nature education of New York and New England. Their findings have been compiled into a mimeographed volume by Prof. Vinal and is offered not only as a memo of the excursion but also as a thought-provoking treatise and a résumé of trends in Nature education. It is available from the school for seventy-five cents. Prospective students who may be interested in such trips are invited to write The Nature Guide School on Wheels, Western Reserve University, Cleveland, Ohio.

Roadstand Contest

Several hundred dollars in prizes will be awarded to the winners of the sixth annual competition for the best appearing roadside refreshment stand and automobile service station in Long Island, N. Y. The contest held under the auspices of the Long Island Chamber of Commerce will be conducted in towns and villages by local contest committees. Entries will be received until September 1 by the local committees. Consult your county chairman for full information. They are: northern Nassau County, Mrs. J. Barstow Smull of Syosset; southern Nassau County, Mrs. Roland Bergh of Woodmere; Suffolk County, Mrs. Norman B. Baker of Greenlawn.

Yellowstone Plants

Plants of Yellowstone National Park, a 160-page illustrated handbook by W. B. McDougall and Herma A. Baggley, is available from the Superintendent of Documents, Washington, D. C., for 25 cents. It is also on sale at the park.

Bluejay Pro and Con

In the June issue of Nature Magazine there appeared in these columns a short story in defense of the bluejay written by Wayland E. Mills. Mr. Mills said, in part, that "—at no time have I ever seen a bluejay in any way harm game birds or songsters or attempt to invade their nests."

From Marion R. Hammer, Jr., a lawyer of Newton, Iowa, comes a difference of opinion. In his own words, he was "pretty much riled up" at the above statement.

"One day last June," Mr. Hammer declared, "three of us were standing under an oak tree at our home when a bluejay attacked a turtle dove, drove her from her nest, pecked the two young doves on the head, threw them out of the nest and then flew to the ground and attempted to further mangle the young doves which were dead when we were able to drive the bluejay away."

"Later the same day," Mr. Hammer continued, "the same jay, or another that looked exactly like it, took the two eggs from another dove's nest, in plain sight of all three witnesses. Had I not seen these acts, I might have felt as Wayland E. Mills felt when he wrote his article," Mr. Hammer said.

Riding in Vermont

Riding enthusiasts planning to spend their vacations on horseback will be interested in knowing about the Green Mountain Horse Association. The organization was formed in 1926 to encourage the raising and use of horses in Vermont and to develop a system of bridle paths throughout the state. It is a non-profit organization, active membership dues being $2.00. Complete information on where to go and what to see on the Green Mountain trails can be obtained from the Association at Rutland, Vt.

Grand Canyon Bulletin

Natural History Bulletin number three of the Grand Canyon Natural History Association has just come to our attention. It is entitled *The Trees of Grand Canyon National Park* and is published to stimulate interest and to encourage scientific research and investigation in the fields of geology, botany, and related subjects in the Grand Canyon region. The bulletin is but one of a series published during the year by the Association. Membership in the Association is $1.00 per year, covering cost of all bulletins and other publications. Bulletins of the Association include: *Mammals of the Grand Canyon Region* (25c), *History and Exploration of the Grand Canyon Region* (15c), *Contributions of Grand Canyon Bird Study* (15c) and the first mentioned publication, priced at 50 cents. Copies may be had from the Association at Grand Canyon, Ariz.

Storm King Mountain

The western pillar of the northern gate of the Hudson highlands, Storm King Mountain, one of the most prominent features of the Hudson River scenery, is now forever preserved against defacement. It has been acquired as part of the New York section of the Palisades Interstate Park. Commissioners of the Park have purchased 203 acres of land lying along the top and the northern and eastern sides of the mountain as far down as Storm King highway from the estate of the late Rudolf Pagenstecher. The purchase places practically all the mountain under the ownership of the state of New York.

A Book of Pheasants

Ten years ago *Pheasants, Their Lives and Homes* was written by William Beebe to sell for fifteen dollars. This followed the first publication of this work in a limited and very expensive edition. Now the volume comes from Doubleday, Doran and Company in an edition that sells for $3.50 and represents a most remarkable bird book bargain for the bird lover.

The material contained between the covers of this large volume was assembled by the talented naturalist-writer over a period of years. The text is in the entertaining Beebe style that so perfectly combines literary excellence with ornithological information. The text is supplemented by many color plates and by black and white reproductions of pictures of pheasants done by the leading bird artists of the United States and Canada.

Hiking and Camping Forum

Conducted by
ERNEST A. DENCH

Hiking and camping inquiries will be answered by mail if a stamped, addressed envelope is enclosed. Address the Forum editor.

Forum Publications

Cookery in Camp and on the Trail: **Chiefly a compilation of sources of information and supply. 10 cents.**

Pestiferous Months Ahead: **Partial list of remedies and antidotes called to Forum editor's attention. 3 cents.**

Let It Rain: **Clothing and equipment protection while hiking or camping on rainy days. 10 cents.**

August Gadget List

1. A one-wheel trailer that is ingeniously constructed and finished to harmonize with the streamline automobile. Quickly attached or detached. Guaranteed not to sway. Carries a load of 750 lbs. Foregoing particulars based on manufacturer's data.

2. A popular-priced sporting goods retailer in New York City introduces his mail order department with a summer camping goods catalog.

3. Cooperative association offers a recipe for a barbecue stick grill combination of pineapple, steak, bacon and sausage. It is included in a canned pineapple recipe booklet.

4. A stoutly-constructed picnic basket. Has two handles and a three-ply hardwood veneer cover. Varnished finish. Same firm also puts out basket refrigerators for carrying iced beverages.

5. A physician is the inventor-maker of a mosquito-chasing device. A small cone, when lighted, produces a pleasant vapor of distilled pine balsam. Suitable for tent entrance or cabin porch. Burns two hours or less, depending on wind velocity, at cost of 10 cents.

6. A new sickle for clearing herbaceous growth from trails and campsites is edged with razor blades. Discarded double-edge razor blades can be periodically inserted to maintain keen cutting edge. It does better work with less effort, Forum editor reports; but keep the wicked tool away from the children.

7. The man who prefers the coat type sport shirt this season has a hard time shopping for it, with the polo pull-over style in the spotlight. Forum editor is enthusiastic about a new coat shirt of generous length, with no tail creeping up unawares. The shirred, half-belted back allows utmost freedom of movement.

For further details of the above products, send for the August Gadget List, enclosing a self-addressed stamped envelope.

Learning From Experience

Kim Hart and a pal, years ago, walked into a grocery store, browsed among the shelves and counters, and purchased anything they fancied. A few minutes later, after dividing the food supplies, they each had sixty pounds, which included clothing equipment; yet—and here's the rub—they *still* were poorly provisioned for their five-day wilderness trip.

Today Hart is the proud possessor of a number of food lists, adapted to varying periods and seasons, and to the number in the party. These lists are consulted beforehand. Here's what he calls his Food List For One Person Traveling Light For Five Days:

½ lb. powdered milk, 10 tea balls, ¾ lb. wheat cereal, 1¼ lbs. sugar, 3 lbs. triscuits, 5 bars vanilla chocolate, 2¼ lbs. dried fruits, several broth cubes, 1 lb. carrots or head of lettuce, 1 lb. macaroni, 1¼ lbs. dried beef, a little salt.

There are a lot of these five-day food lists floating around, and once in a while a fledgling camper wonders why they are not made out for a full week. The explanation is that it usually takes a day to reach a wilderness tract, and another day to return to civilization, when meals are picked up at restaurants and hotels en route.

Hart's load on a five-day stay in the interior has, by skill and experience, been reduced to 34 pounds—and that includes a camera.

Hart repacks dry foods in cloth sacks, in the exact quantities needed. A spillage prevention device, too. He takes triscuits instead of fresh bread—and saves 60% in space and 40% in weight. Hart prefers cooked cereal to pancakes for breakfast—and thus leaves the frying pan home.

A tent is superfluous in a region where open or closed shelters exist at a day's walking distance apart.

A double blanket has not the warmth of two single ones. The blanket transportation trick, a la Hart, is to pack them in a large duffle bag along with the food and strap the bag to one's back. It is sheer agony to drape blankets around your neck, especially when there's a heavy pack to pull you down.

Opinions to the contrary, flannel pajamas are *not* the novice's choice. Most forest rangers wear the two-piece garment because it ensures 20% more sleep, at an addition of only ½ lb. to the daily load.

(Adapted from Kim Hart's article on "Wilderness Travel" in *High Spots,* Adirondack Mountain Club magazine.)

New Pamphlets

American Youth Hostels Handbook. First compilation of its kind. 25 cents. American Youth Hostels, Inc., Northfield, Mass.

Guide to the Southern Appalachians. Appalachian Trail and "feeder" trails from Virginia-Tennessee boundary to Mount Oglethorpe, Ga. Advance mention made because of repeated inquiries. Orders for this guidebook, now in the press, taken by the Appalachian Trail Conference, 901 Union Trust Bldg., Washington, D. C. 50 cents.

Outdoor Recreation Guide. Condensed information on the 65 Connecticut state parks and forests. Illustrated with maps and photographs. An aid in planning Connecticut camping and hiking trips. $1.00. Connecticut Forest and Park Association, 215 Church Street, New Haven, Conn.

National Park Booklets for 1936. One for each of the 22 parks; specify in which of them you are interested when writing for free copies to U. S. Department of the Interior, National Park Service, Washington, D. C.

Publicity For Hiking Trails (Ernest A. Dench). Outline of author's "Keepers of the Log" plan adopted by the Interstate Hiking Club of N. J., and N. Y. 5 cents. New England Trail Conference, P. O. Box 1577, New Haven, Conn.

The Rambler's Handbook. Chiefly a directory of rambling clubs in southern and western England. 8 pence. Ramblers' Association, Southern Federation, 7 Buckingham Palace Gardens, London, S. W., 1.

Camping Holidays. Camping coach facilities of a leading British railroad, and lists of British Youth Hostels and camping sites. Beautifully illustrated. 8 pence. London and North Eastern Railway, Liverpool St. Station, London, E. C., 2.

Scottish Youth Hostels Association Handbook, 1936. Everything embraced by the title. 8 pence. S. Y. H. A., 8 Colinton Rd., Edinburgh, 10.

Loch Lomond Trossachs Guide (Wm. W. P. Morgan). Concentrates on terrain served by hostels in Glasgow district. 8 pence. William Ferris, 159 W. Nile St., Glasgow, C. 1.

The small amounts required for the above British publications can be sent by International postal reply coupons or in British postage stamps procured from philatelic dealers.

The Campers' Handbook

The latest all-in-one publication is *The Campers' Handbook* (Dillon Wallace), published at $2.00 by the Fleming H. Revell Co., New York.

Little or nothing is omitted from the six sections. Wallace bestows lavish praise on the modern trailer coach, the extra gasoline consumption of which rarely exceeds two gallons per 100 miles.

Every camping expert rides his pets—and Wallace's are the Munson last shoe and the rigid rationing of sugar. More than two tablespoons daily is bad for one's innards, he contends—and the author is equally domineering about all other sweetstuffs. Forum editor regards dieting as a civilized custom or fad, with no place at all in wilderness camping.

In other matters Wallace is more fair and reasonable. For instance, he has personally used aluminum cooking utensils for camping for more than thirty years; yet he tells why other metals are to be preferred.

Wallace has, on Labrador trips, lived in Indian tepees. This type of tent is not popular among white campers because it requires from 16 to 20 poles. But the winter camping advantage is that an open fire is possible in comfort and with safety. Reading between the lines—Wallace's lines—

(Continued on page 124)

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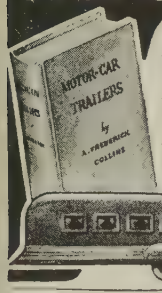

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Petrified Forest Mysteries

Discoveries and mysteries are found in recent reports from Petrified Forest National Monument, Arizona, according to A. E. Demaray, Acting Director of the National Park Service.

Many scientists have long maintained the theory that these world-famous trees, changed by the slow alchemy of time and nature into logs of onyx, jasper, and chalcedony, came to their final resting place in the eroded plateaus of Arizona only after drifting for long distances in the prehistoric seas that once covered these regions.

Objections to this theory have recently been discovered in an excavation reported by the park naturalist. This excavation by CCC enrollees has brought to light the base of a tree apparently upright and in place where it grew in the Chinle shales millions of years ago. The tree trunk has been exposed for some 15 feet and gives every evidence that its root structure is still in place. This supports the theory held by another school of scientific investigation that the trees grew in close proximity to the present petrified forest. Several other stumps with partial root structure and standing in an upright position have been located.

To this disclosure is added the interesting discovery of impressions of cycads, fern leaves, seeds, cone scales, and what are thought to be leaves of the fossil trees. Such finds help in this field of study and permit a more accurate visualization of the forest from which the petrified trees were derived. This discovery raises the question as to whether or not the trees are all Araucarias or whether there were two species present—true Voltzias and Araucarias—growing contemporaneously in this far off Triassic period.

Still another peculiar angle is reported by the investigators, which may account for the apparent scarcity of good root structure and branches throughout the Petrified Forest. It was noted that the roots were not silicified, but turned to carbon. Approximately 2 inches of carbonized material covers the trunk, making it look as if it had been burned. Beneath this layer of carbonized wood the trunk is silicified.

Camps For Summer

The busy city is not the place for your boy or girl during the hot summer months. Those wise parents who plan to send their children to a summer camp in New England will be interested in an illustrated booklet on the leading New England camps, furnished free by the New England Council, 1032 Statler Building, Boston.

Flower Handbook

A practical reference volume that the amateur flower gardener will consult a dozen times a day has been published by Coward-McCann, Inc., New York. The book, entitled *Flowers to Grow and Gather,* was written by Marion W. Flexner and Isabel McLennan McMeekin, amateur horticulturists who, from experience in their own gardens, have realised the need of a book so compiled that an answer to a troubling question can be found in a few minutes. The price of this excellent work is $2.50.

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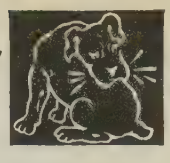

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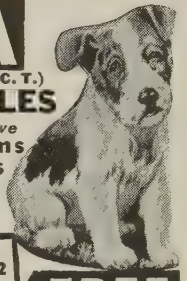

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Hiking and Camping Forum

(Continued from page 122)

teepee experimentation is a hobby only seasoned campers should adopt.

Camping at New York's "Back Door"

There are not many park directors who give hikers the free rein they have had for many years in the Palisades Interstate Park of New York and New Jersey under the stewardship of Major William Welch. In this rugged tract of some 47,000 acres, all trails were originally laid out by hikers, and are still maintained by them on a volunteer basis. Much of the credit for such harmony belongs to Raymond H. Torrey and his N. Y.-N.J. Trail Conference.

On the longer trails are open-front shelters, built of native materials. Each shelter is equipped with cooking ovens, inside and outside fireplaces and double-decker metal sleeping bunks. Occupancy is a case of first come, first served, with the stay at any one shelter limited to an overnight.

The P. I. P., as it is good-naturedly nicknamed, is also the camper's paradise. In the height of summer some 50,000 people are housed for two-week periods in the ninety group camps leased to adult and juvenile organizations.

The camping areas for individuals and families are adjacent to the Seven Lakes Drive, the park's main traffic artery. They are attractively placed along the shores of artificial lakes, where bathing and boating may be enjoyed.

Motor campers have choice of eight sites without charge for a single night, but after that the fee is $1.00 per night or $2.00 weekly.

There is also a tent camping area, where a weekly fee of $2.00 allows one to erect a tent not ever 10 x 12 feet in size. No more than four persons must occupy the tent. Those who come unprepared may rent a tent and a fly for $1.00 weekly.

Rainy day boredom can be escaped by driving into New York City, 40-45 miles distant, for a round of sight-seeing and entertainment.

Further information and permits are available from Miss Ruby M. Jolliffe, camping superintendent, Palisades Interstate Park, 141 Worth Street, New York, N. Y. A map of the Harriman section of the park sells for a quarter.

Variety in Camp Foods

A hark back to pioneer camping days is the provisioning technique of large quantities of too *few* products. It must be in the blood, when you will even find trailer owners guilty of the practise. They seem to forget they have a home on wheels, and that it is possible to maintain a larder as complete as that in their city residence.

"Ah, camping out; that's different," they argue. To play the part they load up with enormous quantities of flour, bacon, beans and a few other staples. Later their digestive systems suffer, and the trip loses its zest.

In some cases this *lot of little* provisioning trend holds the fort because menu planning is left until the last minute—and food purchases likewise. This relates to the trailer proposition of selecting a camping base where a reasonable degree of solitude and unspoiled nature may still be found—rarely within a short drive of the village food store.

To ensure a replica of the varied selections accustomed to at home, write out the past week's menus. Ascertain if there is an unperishable substitute for the perishable product—the kind you miss most when freed from the shackles of civilization. You had fresh chicken last night. Good; you can get a cooked bird in a can. Sliced boiled ham appeared for Sunday supper. Again you are in luck, for there is a canned variety, which is, to the Forum editor, even tastier than what the delicatessen slices for you off the machine.

Cultivate this combined knack of visualization and adaptation, and in most cases, with the advances in modern food processing, you will find the fresh product has a packed counterpart.

And we may leave a sparse commissary based on antiquated diet standards to the camper who is a diehard Spartan.

What Australian Campers Eat

Recipes for pufftaloons and crêpe rubbers are among the camp cookery oddities in *Bushwalking and Camping.*

The pufftaloon, which seems to be a fried scone, requires mixing a moist flour dough with water, and depositing tablespoons of it into the boiling fat of the frying pan. They brown very speedily, and need turning over with a fork.

The crêpe rubber calls for a batter so thick that it will drip into the frying pan only with the vigorous shaking of the spoon. The blobs should circulate on a dry, hot, clean pan. They will not stick. Turn when done on one side. Taste is improved by blending a small quantity of butter with the dry flour. A few raisins might be added.

You can only try—and if the result it not up to par, remember the Australian author, Pally Pallin, is located at a safe distance.

Equipment is described as gear in this Pallin pamphlet, while pots are billies. The "swag" is our old friend, the dunnage bag. An educational sixpennyworth (about 12 cents) from the author at 312 George Street, Sydney.

Mount Whitney's Lost Prestige

The highest peak in these Continental United States is dislodged from its lofty perch in *The 25 Famous Mountains* pamphlet published by the Pacific Crest Trail System Conference. Here's Clinton C. Clarke's candid analysis of Mount Whitney: ". . . It is not impressive as a bit of mountain sculpture. It is also disappointing as a climbing problem. . . ."

It does, of course, give you confidence in Clarke when he finds a mountain which dips heavily into his stock of adjectives. All peaks are on the Pacific slope but the Olympus group in Western Washington is omitted.

Another recent release is a folder on *The Pacific Coast Trail System.* It is a log of mileage, approximate walking times by days, possible overnight camps, places where food supplies can be replenished, and branch trail exits. It embodies, with a condensed map, all the trunk trail links, for use with the large scale map folders of the U. S. national forest and national park services. U. S. Forest Service at either Portland (Ore.) or San Francisco will send the map folders free. But the two Clinton C. Clarke publications are ten cents each, from the compiler at 125 S. Grand Ave., Pasadena, Calif.

Learning Camp Cookery

At this season many fledgling campers yearn to try out their wings. Camp cooking skill is acquired by one experiment after another—the perseverance which converts a failure into a success.

Conduct your open air laboratory where it involves no risk, not even to yourself. Go on half-day or all-day hikes, carrying along your cooking utensils and food. Be sure to take along your emergency rations—sandwiches and a vacuum bottle—in case you fail to get the fire going, or the planned biscuit recipe produces a stack of bricks. Charge any such experiment up to experience, and indulge in a hearty laugh as you nibble on a sandwich and pour out a cup of hot coffee from the vacuum bottle.

Continue the camp cookery operations on short local trips until you make substantial headway. Time now to try an overnight trip. If that goes off without a hitch, you can consider a vacation camping expedition. Invite a novice pal or two for company—and for dish washing and fuel gathering and chopping.

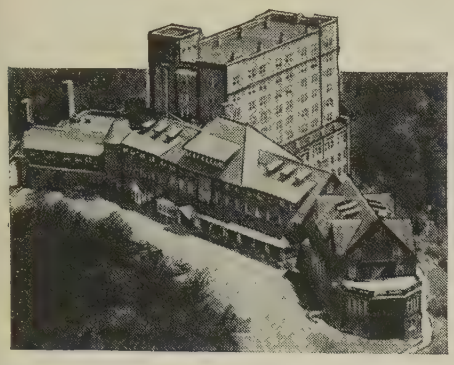
Quality Foods for Camping

To pull up stake even only a day less than you intended is a sad climax to a camping trip. It has happened—and will continue to prevail—when a Commissary Chief thinks more of saving a few cents on this and that food item. He should take the long-range viewpoint, that of the gastric enjoyment of his party.

The cheaper grade of an untried food product may prove so unpalatable that scarcely any of it is eaten. Take the case of cheap jams and preserves, made with limited amounts of inferior fruit, reinforced with substitutes. The best grade is wholly composed of perfect fruit, rich in sugar content, and immeasurably more tasty and satisfying. The list of such food contrasts could be extended over several printed columns.

The human system undergoes a great change on an outing trip. For the first few days everything and anything in the edible line will be relished at mealtimes. One yearns, long before the end of a vacation camping trip, for a home-cooked or restaurant meal with all the fancy trimmings. Quality foods, apart from their tastiness, usually possess higher nutritive values, and tend to prevent appetite discontent from developing so quickly.

TOP OF THE POCONOS



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Downy and the Cocoons

By Marian Schoolland

Downy Woodpecker discovered a feast hanging in our lilac bush. Five cynthia moth larvae had made their cradles there. How did Downy know that a juicy morsel was wrapped in the dry leaves? When I noticed him he was swinging on a bit of twig and jabbing with his bill as he swung. I went close to the window and saw that it was a cocoon to which his feet held so tightly and at which he was hammering so industriously. Hanging thus, upside down, and swaying with the slender branch, Downy worked for fifteen minutes without stopping. Then he flew to a near-by clothes pole, perhaps to relax his tired muscles. But in less than half a minute he was back at work. Fully ten minutes more he clung and labored. Finally he flew away.

When he was gone I went out to see what he had accomplished. Cocoons, I know, are very tough. I found a very neat hole in one side of the cocoon. My little magnifying glass showed no signs of the little hammer having missed the mark at all. Through that perfectly round little hole, not yet one-eighth inch in diameter, the fat cynthia larva met its fate. Inside there was only a shell left, the skin of the larva, still wet, but empty.

Of the remaining four cocoons, two are similarly pierced. Perhaps Downy is reserving the other two for tomorrow's dinner.

"Blind Spots" Checked

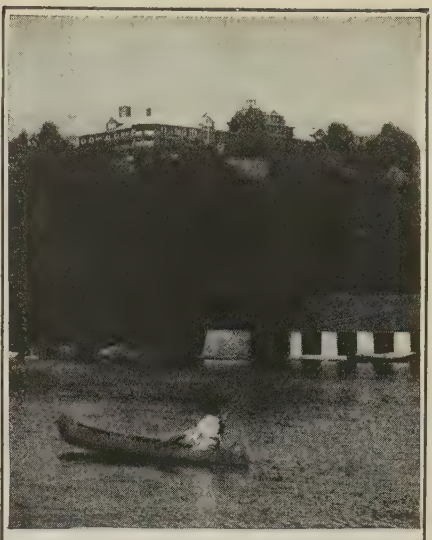
The national forests are having their "eyes" examined. In many of them, the United States Forest Service is checking visibility from the fire-lookout stations, the "eyes of the forest."

Once forest fires start, the principal objective is to keep them from spreading. Quick spotting of fires is a primary duty of national forest guardians. It is desirable to check and recheck to improve lookout locations or find places where new ones are needed.

Locating lookouts to obtain maximum coverage always has been difficult because it is impossible to tell from the ground what may be seen from a hundred feet in the air. To determine just what a lookout can see and where other lookout points should be located, the country is mapped from each existing lookout tower. All areas are classified as visible or invisible, a painstaking job requiring intimate knowledge of the surrounding country. A trained engineer and mapper does the work, usually accompanied by the lookout men.

On the resulting map, the areas visible from at least one lookout are shown in solid colors. Invisible areas or "blind spots", left blank, show that relocation or additional lookouts are needed. To be classed as visible, the land must lie so that smoke can be seen as soon as it emerges above the tree tops.

Visibility maps—one for each area covered by a tower—are drawn to the same scale, and then superimposed on a large map. Then the map makers begin the difficult work of locating "blind spots" and prominent hills or rises that give coverage. This is done only by hard field travel.



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Bernice, the Goose

By Bernice H. Hussey

When I first made the acquaintance of the goose, it was only a small and bedraggled gosling, dejectedly piping and whimpering in a box under the kitchen table. It had just been brought from its barnyard home, and its loneliness touched my heart. When I learned that it had been named for me (rather a doubtful compliment) I naturally took a personal interest in its welfare. The gosling's new home was at Woollen's Gardens, a beautiful tract of woodland belonging to the City of Indianapolis. Mr. Allison, the custodian of this park, had bought the gosling of a neighboring farmer and brought it to his home for a pet, but the cold spring weather made it necessary to keep the gosling in a box in the kitchen, and it was dissatisfied with its new home. It refused to eat, and sat in a corner of its box and cried day and night.

Finally a warm, sunny Sunday dawned, and, in company with a group of members of the Nature Study Club of Indiana, I went to Woollen's Gardens to spend the day. As soon as I arrived, I went to Mr. Allison's kitchen to see how the gosling was progressing, and found it in such poor spirits that I felt it was not long for this world unless it had a change of scenery. I carried its box out on the lawn and lifted it out and put it on the grass. At first it seemed terrified to be out of its box. Then it discovered that grass was good to eat, and began gobbling as fast as its little bill would work. Suddenly it dawned on the gosling that its box, which seemed to take the place of a mother with it, was not in sight. It began to quack in a piercing voice and ran about distractedly until I caught it and put it back by the box, when it quieted down and continued picking grass contentedly.

Everyone who visited Woollen's Gardens was interested in Mr. Allison's unusual pet, and several know-it-alls suggested that the gosling should "take to the water like a duck", so I carried it down to a little stream which trickles through the woods and put my charge down in the shallow water. Evidently I had been misinformed as to the habits of geese, or else this was a very unusual goose, for it scrambled out of the water at once, and repeated efforts to interest the gosling in this new element were unavailing. Finally I started back to the cottage with my namesake toddling after me, a complete failure as a swimmer.

From that time on, Bernice, the Goose, began to grow in stature and in grace. Visitors to Woollen's Gardens were much interested in her, and she soon became very tame, waddling about in an interested fashion among the callers who might be seated in chairs and swings on Mr. Allison's lawn. It was not unusual to feel a tugging at your shoestrings and look down to find this solemn, fluffy little creature earnestly trying to walk away with your shoestring in her bill.

Another of Mr. Allison's companions was a beagle hound pup called Peggy, and it was not long until Peggy and Bernice had formed a fast friendship. They played about the lawn together, and sometimes when the goose was in a very good mood, she would pull the dog's long ears with her bill, and Peggy would submit to this with a contented expression on her doggy countenance, sometimes almost going to sleep under the operation. As the summer advanced, numerous picnic parties came to the Gardens and spread their lunches on the tables along the creek bank. Almost any day one could see the dog and the goose sauntering about among the picnickers, watching out for a stray bite, and they were seldom disappointed. In fact, they both grew fat from the generosity of picnic parties.

We still felt that a goose should be fond of the water, and sometimes would carry her down to the creek bank and toss her in the creek. She would swim around for a moment and then make a bee-line for the bank, and no amount of yelling or chasing could get her back in. She simply loathed the water and could not get out of it too quickly. As far as she was concerned, water was only for drinking purposes. She often took a bath in her drinking pan and seemed to enjoy splashing the water over her feathers, but a bath in the creek was something she would not accept.

One hot summer afternoon I decided to take a stroll through the woods alone, but soon found that I was to have company on my walk. As I started to climb the hill I heard an insistent quack, and looking back saw the goose, now about half grown, waddling hurriedly up the hill after me. Soon the dog came racing after us, and with these two good companions I began the most ridiculous walk imaginable. While the dog would race off into the woods to investigate some interesting scent, the goose never wavered from the path, and the pad of her webbed feet could be heard distinctly on the hard ground as she waddled earnestly at my heels. Sometimes she would suddenly spurt ahead for a few steps, but would soon drop back. I smiled to myself as I imagined what a picture I must present had anyone been there to enjoy it. Thus we continued until we were nearing home, when the dog became quite frisky and began to chase the goose in a spirit of fun. Round and round me they ran, the goose not quiet able to see the funny side of it. Finally, she came to bay, panting, and hissed menacingly at her tormentor. This took the dog down a peg, as she did not expect such a come-back, and we continued our walk without further horse-play.

The goose loved to follow people on their strolls through the woods, and one very hot day she tagged after some people who took a longer walk than usual. Mr. Allison was much startled when he happened to look out the window and saw his pet being carried up the walk in the arms of a very fat and perspiring man, whose kindly heart could not bear to see the poor goose all tired out. In fact, Bernice was so spoiled by everyone who came to the park that she finally became quite a nuisance, always being under foot. If Mr. Allison set the table on the lawn, one could hardly eat for this large, inquisitive fowl roaming about in a lordly manner and suddenly poking her head towards the table in the hope of snatching a bite.

As autumn approached, it became evident that Mr. Allison could not keep the goose during the winter, and he cast about for some good home for her. This was provided unexpectedly when the head of the nursery at one of the city parks visited Woollen's Gardens one day and was immediately smitten by the charms of the goose. Mr. Allison was only too glad to make Mr. Miller a present of the fowl, and so Bernice went to live in Riverside Park with several hundred mallard ducks. At first I could not reconcile myself to the loss of my pet, but realized that it was all for the best, and soon went to Riverside to pay my goose a call. She seemed in good spirits, but did not associate with the ducks which swam happily about on the small lake. The goose has now become the pet of Mr. Miller and stalks about majestically in his yard. Recently her name was changed to Bernard because people who considered themselves authority said she was a gander and not a goose at all. This was quite a blow, but since then I hear that they have decided she is a goose after all, so she is still my namesake, Bernice the Goose.

The Invalid

By Marcia M. Eagen

Early last summer I was sitting beside the window to which our bird feeding station is attached, when a female robin hopped painfully on the platform. Her right foot had been badly torn. She remained there for a long time, lifting the injured leg and putting it under her feathers. Another robin alighted on the feeder and chased her away. Many times have I noted that birds are unkind to another that is injured and is thus unable to defend itself. "Hippity Hop," as I have named her, returned many times, however. The leg gradually healed, and though she was clumsy in her movements, she could fly as well as the other birds. During her moulting period she was a pitiful sight, seeming unable to take care of her feathers. Although the other birds mistreated her she stayed throughout the summer and left late in September.

I watched for her eagerly every day this spring, wondering if she had survived the winter. My vigil was rewarded in April. Hippity Hop hopped up to the feeder, quite agile for a one-legged bird. She ate a few raisins, took a drink of water and flew to a nearby roof where she used to sun the injured leg.

More Credit to the CCC

Much of the success of the waterfowl-refuge program of the United States Biological Survey is due to the work of twenty-two CCC camps. Under the direction of Survey engineers and biologists, the CCC boys have done a thousand and one necessary jobs, says J. C. Salyer, Chief of the Bureau's waterfowl division.

An outstanding example is the seed gathering and food and cover planting for wildlife. Tons of seeds and tubers were collected last fall on many refuges by the CCC and stored for planting.

In addition to developing the natural supply of foods, ECW workers planted patches of corn, wheat, barley, and millet, and hauled screenings donated by the elevators to the refuges for feed. More than eighty tons was stored for this winter in granaries built with CCC labor.

On some areas the Bureau found it necessary to raise stock in nurseries and many an embryo nurseryman was discovered among the workers.

Sesquicentennial Planting

In cooperation with the U. S. Constitution Sesquicentennnial Commisssion, Charles Lathrop Pack, president of the American Tree Association, has opened the campaign to mark the 150th anniversary, Sept. 17, 1937, of the submission of the document to Congress, by planting trees. With arbor days at hand Mr. Pack has begun distribution of his Constitution Sesquicentennial Tree Planting Book to club and organization leaders as well as school teachers throughout the nation. The book carries the Constitution, all amendments, with dates, tree planting suggestions and the commission's request that the American people make plans now to plant.

To the governors of the original states ratifying the Constitution, Mr. Pack sent the suggestion that "ratification days" in each state be marked by organizing state-wide plans for tree planting in anticipation of the big program in 1937.

"The Constitution," says Mr. Pack, "stands like a great oak. It has weathered many storms. It deserves a place next to the family bible in every home. What could be more fitting than for the American people to begin now to make their plans for marking the sesquicentennial, Sept. 17, 1937, by planting trees? We are ready to distribute the Constitution Sesquicentennial Tree Planting Book, to school teachers, organization leaders or anyone interested in tree planting. In it is the Constitution and all amendments with every important date, as well as George Washington's letter of transmittal to the Congress. With this are given details on how to select, plant and care for trees and a suggested program for the dedication.

"As the statement of the U. S. Constitution Commission points out, nearly thirty-five million trees were planted to mark the bicentennial of the birth of George Washington. Now we have another reason for planting. Then we honored the Father of our country and now we mark the crowning achievement of his great career, the binding of the nation together under a Constitution. Historians all agree he made the Constitution possible.

"In our planting plans we not only have the call of the Commission to heed but we have the cooperation of thousands of organizations. At the Miami meeting of the General Federation of Women's Clubs, Mrs. H. G. Bogert of Colorado, national conservation chairman, started a tree planting campaign reaching into every club. In the Daughters of the American Revolution, Mrs. Avery Turner of Texas, national chairman of conservation and thrift, has called upon all chapter chairmen to push the program. The American Legion Auxiliary, the Boy Scouts, the Camp Fire Girls, American War Mothers, the National Grange, 4-H Clubs, and civic and conservation organizations of every kind are being enlisted in the project to join the tree planting army by planting trees to mark the date.

"In colleges and high schools, as well as private institutions, every sesqui-year class is being asked to plant a sesqui tree as a class activity. In the citizenship committees of various organizations, tree planting will be a major activity. One of the tree planting books has been sent to every CCC camp. So let us plant not only to mark this important date in our history, perhaps the most important date, but also to call the attention of new thousands to the value of trees."

Florence Merriam Bailey

(Continued from page 71)

was a child, in the long summer evenings we have walked through the woods to 'William Miller Hill', to see the sunset and listen to the hermit's vespers." There is that sentence in your "Red Letter Days in Southern California" that tells of a barn on the roof of which "a red-shafted flicker rested, and inside a barn owl napped, while two ravens perched on rafters enjoying the cool shade in the heat of the day". In "A Return to the Dakota Lake Region" you wrote, "late one August afternoon, after a thunderstorm, there was a charming picture of the peaceful quiet life of the waterfowl undisturbed by man;" you told of how "a sudden rapturous burst of song came from a Sora"; and you described the "pretty sight" that a flock of about forty ruddies "made, riding mirrored on the smooth water, a blue bill and white cheek patch in duplicate making indeed a striking picture" and told of how "a big mother canvasback swam in through an open space between the ruddies—a steamship plowing its way among motor boats—leaving a long, strongly marked wake behind her and diving at its point; in feeding, one of her family stood on his head, tail in air; another, after bathing, rose so straight he almost tipped over backwards." So many vivid quotations come to mind from your wealth of August bird lore!

At the close of one of these Dakota days, you wrote, "as I carefully withdrew leaving the birds undisturbed in their safe haven for the night, I passed up the road by the lake now bordered with golden wild flowers. From the east a flock of black terns came speeding in. From the sunset a golden portico was reflected in the lake, its illumination spreading to a wide golden band reaching across the water. Into the east came a soft pink afterglow, and well up in the sky rode the harvest moon, while the weary harvesters, their day over at last, were wending their way slowly home."

Mrs. Bailey: Thanks for what you have written of August! May the recollections in these paragraphs make this August happier for you, and may the road up which you pass be bordered with golden wild flowers, the sunset be a golden portico, and may you wend your way slowly home, ever so slowly.

Sincerely,
HOWARD ZAHNISER.

P. S.: Do you remember how, one "10th of August, the great meteor night, . . . as it grew darker, the meteors came thick and fast, little and big, till the children shouted excitedly whenever one shot through the sky. After watching quietly for a time, their mother said meditatively, 'It seems so funny—up in the sky—it seems as if somebody took a light and run.' "

Earless Mink

A family of mink that has gone in for modern stream lines is reported from the state experimental game and fur farm, Poynette, by Dr. Earl F. Graves, conservation department pathologist.

Every one of a litter of six mink were born without ears, a simple hole in the head showing where the ear should be. Dr. Graves says the mink are normal in every other way and are growing fast.

Cookery in Camp and on the Trail . . .

IF you are a hiker, camper or motor camper you will find this 24-page booklet valuable. It is a compilation of sources of information and supply on camp cookery books and pamphlets; recipe literature; specialty foods for campers; hot and cold concentrated beverages; cook stoves and accessories; cooking utensils; fire-making devices; fuel tools; portable refrigerators and accessories.

The booklet contains suggested menus and lists for camping and hiking trip provisioning.

The compilation has been in the making many months under the direction of Ernest A. Dench, Editor of Nature Magazine's Hiking and Camping Forum.

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"The Physical World"

For several years the need has been recognized for a book that would deal in an understandable way with some of the outstanding phenomena of physical science, and yet would not frighten away the reader by display of mathematical formulæ and endless problems. A very excellent attempt to meet this demand has just appeared in a volume entitled *"The Physical World,"* by Dr. Louis M. Heil of Ohio University. For purposes of definition he has divided his subject matter into eleven units. These deal in a very readable way with such themes as the history and meaning of physical sciences; various explanations of the workings, size, shape, and complexity of the universe; and the various types and states of matter, heat, sound, magnetic and electric phenomena, optics and light, and other like things which puzzle and sometimes utterly bewilder the more thoughtful students of the great outdoors. Especially helpful is the compactly presented information on X-rays, their production and uses as well as the properties of radioactive substances. Published by P. Blakiston's Son & Company of Philadelphia, the volume contains 566 pages, and 426 particularly helpful and well selected illustrations. It is expected that this book will attain a wide popularity among the more thoughtful lovers of Nature.

Flowers for Perfume

Many plant flower beds for color and decorative masses, kitchen gardens for utility, herb gardens for savor, but only a few plant for perfume.

Women of Martha Washington's time knew how to save the delicate scent of rose petals by putting them in jars with salt, or they made a potpourri of different flowers. They gathered damask, roses, and lavender and dried them to make linen drawers sweet, or used violet water. They liked the scent of lilies-of-the-valley and lilacs.

It is possible to plant shrubs and vines and flowering annuals and perennials to add to the fragrance of the garden—roses, English violets, carnations, and little clove pinks, and some of the fragrant peonies for indoor vases.

The United States Department of Agriculture has a number of free bulletins with many references to flowering plants with delightful perfume.

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"Unsolved Problems of Science"

It is a good thing occasionally in any enterprise to take stock of unfinished business. To admit, for instance, something of the extent of human ignorance should prove to be a wholesome exercise. Since Newton's day the "great ocean" of ignorance has been driven back only little by little. A considerable number of the more provocative problems that scientists are trying to solve are discussed in a popular way in the newly issued volume by Professor A. W. Haslett entitled *"Unsolved Problems of Science."* (New York, Macmillan, $2.) Among the curious and interesting themes treated are: why sugar is sweet; why a steel girder is not a thousand times stronger than it is; why some summers are dry and others wet; how was the world created; how did man begin; are there other worlds than ours; is man a machine; is disease conquerable; and, is there such a thing as telepathy. It is likewise pointed out that we are still equally ignorant of the nature of life and of the cause of the common cold, that the atoms and the stars alike still guard many of their most fascinating secrets, that the glow worm still lights his lamp more economically than can man, and that no one is yet learned enough to convert the sun's energy into living food as every green plant does day by day. This little book is stimulating to the layman, yet not without value to the scientist; emphasizing the unknown, yet providing, incidentally, an interesting picture of some of the things already known.

Cookery in Camp and on the Trail . . .

IF you are a hiker, camper or motor camper you will find this 24-page booklet valuable. It is a compilation of sources of information and supply on camp cookery books and pamphlets; recipe literature; specialty foods for campers; hot and cold concentrated beverages; cook stoves and accessories; cooking utensils; fire-making devices; fuel tools; portable refrigerators and accessories.

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The compilation has been in the making many months under the direction of Ernest A. Dench, Editor of Nature Magazine's Hiking and Camping Forum.

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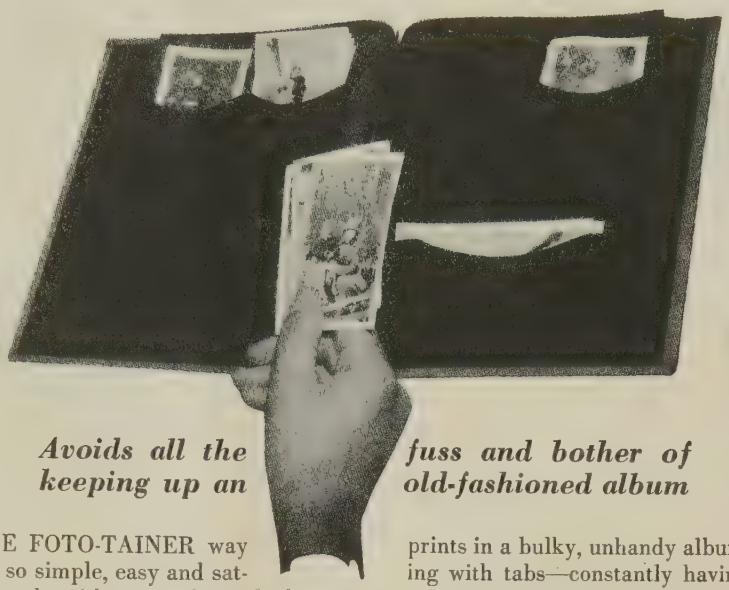

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Photographic Notes

BY SAMUEL BROWN

On the Farm

The farm offers the cameraman a host of unusually interesting story-telling pictures. There is so much to photograph that our cameras can be kept busy constantly. For example, pictures of sowing and harvesting tell interesting stories as do hay making, egg gathering and milking. The cows, chickens, pigs and horses make excellent subjects.

Much of the value of any picture lies in the story that it tells. There should be a reason for taking any photograph; it should be attractive not only to its maker but to anyone who is likely to see it. A series of pictures telling a consecutive story is an aid toward this. On the farm this idea can be carried out by photographing the beginning of something—planting a field, for example. As the first leaves make their appearance a second group of pictures might be taken. As the crop grows it may be photographed in its different stages and later on the picking or harvesting may well complete the series. Here we have a story that is bound to have meaning to everyone.

Many beautiful pictures, outstanding for their attractiveness alone, may also be taken on the farm. A picture of a group of cows on a hillside with a panorama of the surrounding countryside makes a lovely photograph. The farmer behind a plow which is drawn by a pair of horses and photographed during the late afternoon against a clouded sky from a low point of view will make an excellent picture and be extremely rich in story-telling value.

The light on a farm is generally very strong since the sun shines directly down without diffusion. For this reason it is necessary to give less exposure than would be required for normal subjects. Small stops from F. 11 to F. 22 may be used with the shutter set at 1/25th of a second. This will result in good depth of focus.

Panchromatic films are to be preferred since they will render colors properly in their corresponding values in monochrome. A light yellow or sky filter will help to bring out clouds on the negative which are sure to add value and interest to the picture.

A COMMON FARM SCENE TAKEN AT F. 9, 1/30 SECOND ON VERY SUNNY DAY USING PANATOMIC FILM

"A COUNTRY ROAD" TAKEN AT NOON ON VERY HAZY DAY USING PANATOMIC FILM, F.4, 1/30 OF A SECOND WITH X-1 FILTER

Photographs taken on the farm have an attraction beyond the mere record. They are interesting for the story they tell and when properly taken, their pictorial value makes them beautiful to see.

Motion Pictures

Of late, many amateur photographers have turned their interests to making motion pictures. Inquiries coming in to this department indicate a definite need for more articles on this subject, especially since it is now so easy to make movies in full natural colors indoors and out. Many persons have denied themselves the pleasure of taking motion pictures due to the expense involved. However, recently there have been placed on the market some cameras which take 8 mm. movies and which have cut the cost of pursuing this phase of photography to one quarter of its original cost.

Making 8 mm. movies is extremely simple. Merely load the 25-foot reel of 16 mm. film, especially prepared for these cameras, into the machine. The lens is so constructed that it will make pictures on only one half of the film. After the twenty-five feet are run off, the film is reversed and the second half run off. When the film is processed the laboratory splits it in half and splices the two pieces into one fifty-foot length which makes it equal in projection time to one hundred feet of regular 16 mm. film.

The value of still Nature pictures cannot be denied but it is left for the Nature motion picture cameraman to show birds and animals in action, insects laying eggs and caterpillars spinning cocoons. Movies over distances may be taken as close-ups through the use of telephoto lenses. Almost all of the new style movie cameras work with a spring motor which has eliminated the hand crank. In this manner there is an even run of pictures and jerky motion is eliminated.

The common tendency of the beginner with a moving picture camera is to make his scenes too short with the result that when they are projected the scenes flash on and off the screen too quickly. The absolute minimum that should be considered is a shot that will last 7½ seconds. This will require 1½ feet of 8 mm. film. These rules hold true for pictures with little or no action such as close-ups of people or scenes. If the action is changing, more film will be required. Ordinarily the camera should be started just before the action begins and stopped just after the action ends.

There are few occasions when it is absolutely necessary to use the camera in the hand. The human body is never still and this will show greatly magnified on the screen if the pictures are made with the camera in the hand. Always use a tripod!

Panoramic views, which are made by pivoting the camera in a horizontal plane while it is in operation, are interesting but very disappointing if not properly made. There are several precautions to be observed if successful panorama shots are to be made. First of all, move the camera very slowly; this point cannot be too strongly emphasized. If you feel that you cannot do this slowly and steadily enough, set the camera at 24 frames per second and open the lens one-half stop more than required for the 16 frame speed. A good method is to swing the camera slowly past objects of general interest until you see in your view finder a picture of particular interest. Hold the camera steadily on this subject for about five seconds and then swing slowly on to the next scene of importance and then stop again. This procedure will give the audience a chance to enjoy each outstanding point and still preserve the value of the panorama—the showing of elements in their relation to each other. Whenever possible, pan from left to right because it is easier for the eye to follow motion in this direction.

A new pamphlet entitled *How to Make Inexpensive Personal Movies* has just come

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to this writer's desk and we feel that every potential movie maker should have one. This booklet describes some of the 8 mm. motion picture cameras previously referred to and shows how simple and inexpensive they are to operate. Copies will be sent to everyone requesting them from the Bell & Howell Co., 1813 Larchmont Ave., Chicago, Ill.

A TYPICAL FARM SCENE TAKEN ON DULL DAY. S. S. PAN, F 3.8 AT 1/25 OF A SECOND

Camera Types

The last of the camera types to be discussed by this department are those that fall into the miniature class. These are generally of high precision having the finest lenses that it is possible to make, a built-in range finder that assures sharp focus for every exposure and is of such small size that it can be carried unobtrusively.

The two outstanding cameras in the miniature class are the Leica and the Contax. These use 35 mm. film which is available coated with any emulsion that is likely to be required. 35 mm. film can be purchased in special spools or cartridges to fit the cameras and permit from 30 to 36 exposures without reloading. This film may also be bought in bulk from 25 to 100 feet per roll and cartridges may be loaded from this by the user.

One of the features of these miniature cameras is that they permit an interchange of lenses for either wide angle or telephoto use. There is also available a considerable number of accessories that adapt the camera to any type or phase of photography, including copying, photomicrography, stereoscopy, infra-red, medical and many others. Focal plane shutters that work at a number of instantaneous speeds ranging from one full second to 1/1000 of a second add to their versatility. Another feature is that double exposures cannot be made accidentally because the shutter is set automatically when the film is moved and this cannot be moved again until the shutter is released.

Other cameras in the miniature class are the Super Nettel which is like the Contax but does not possess the interchangeable

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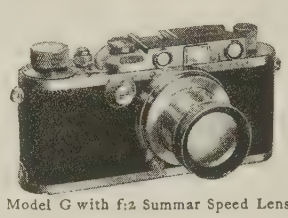

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lens feature; the Super Bantam, which uses special film, has an F. 2 lens, built-in range finder and a Rapid Compur shutter; the Super Ikomat, which uses standard size film and has a built-in range finder, and the many half vest pocket cameras which have some of the features of the other miniatures.

Due to their adaptability, miniature cameras have become so popular that they are now being used by an increasing number of enthusiasts. The convenience of having a larger than usual number of exposures in the camera at one time makes them handy to take along on field trips and Nature picture hunts and the inexpensive film makes them economical to use.

Trade Hints and New Books

There are few stories that are as fascinating as the history of photography. Twelve centuries ago Aristotle made the first discovery that has led to the perfection that the photographers of today enjoy. Romance and adventure have had their place in this advance. This writer has secured a number of copies of *From Aristotle to Eastman,* a vest pocket history of photography, which he will be happy to send to those interested. Please enclose a stamped, self-addressed envelope plus a two-cent stamp with your request.

A new 8 mm. movie outfit has recently been announced by the Bell & Howell Co., 1813 Larchmont Ave., Chicago, Ill. Many new features, among which are the high speed F 2.5 lens, extra lenses, light weight, small size and inexpensive price, make it available for anyone interested in this phase of photography, with the greatest degree of precision and simplicity. This camera is known as the "Filmo Double 8 Cine Camera" and further information is obtainable from the above company.

Burke & James, Inc., 223 W. Madison St., Chicago, Ill., have announced the new "Weltur" miniature camera. This instrument combines utmost precision with many distinctive features. A built-in range finder coupled with the lens, rapid Compur Shutter, and depth of focus scale make it ideally suited for a large range of subjects.

The latest photographic magazine and the one, in this writer's opinion, that will prove extremely popular is the new *Photographic Digest* about to make its appearance. Edited by George W. Hesse and technically directed by Karl A. Barleben, Jr., this magazine has on its editorial staff two men who need no introduction to photographic enthusiasts everywhere. Be sure to get the first issue at 25c per copy. The address is 267 Fifth Ave., New York, N. Y.

The Itinerant Photographer by George H. Chappell, published by Schoenig & Co., Inc., 8 East 42 Street, New York, N. Y., tells of the latest methods employed by the traveling photographer. A decidedly informative little book for the person interested in making money at photography. Price 50 cents.

A writer already known to readers of this department is Mr. William J. Shannon of Moorfield & Shannon, Nutley, N. J., publishers. Mr. Shannon has outdone all of his previous works in producing his latest book, *Camera Trails Through the Southwest.* Many suggestions on what and how to photograph points of interest in our National Parks are made. I was especially impressed by the underlying current of conservation all through the book. Whether or not you are planning a trip through our National Parks you will want a copy. The price is only 75 cents from the publishers.

The photographic department of NATURE MAGAZINE is devoted to its readers interested in photography and maintains a service which renders assistance with any photographic matter. You are invited to take advantage of this service. Address all photographic inquiries to Samuel Brown, NATURE MAGAZINE, 1214 Sixteenth St., N. W., Washington, D. C.

Cordially,

SAMUEL BROWN.

For Dog Owners

We are in receipt of an interesting booklet entitled *What You Should Know About Me,* the "me" being your pet dog. A lot of valuable information on bathing, diet, exercise, and the prevention of fleas and worms is contained in the small space of 23 pages and all members of the American Nature Association who are interested may have a copy for the asking.

"The Living Garden"

An excellent book with the above title describes the how and why of garden life. Plant lovers, whether gardeners or not, will find information and enjoyment in these pages. It is enough to say that the book, written by E. J. Salisbury, won the Veitch Memorial Gold Medal of the Royal Horticultural Society for its excellence. It is priced at $3.00 from the publishers, the Macmillan Company, New York.

Another County Heard From

Adding fuel to the controversial fire concerning the bluejay's qualities, which began with the publication of the note of "Why Harm the Bluejay?" by Wayland E. Mills, we print excerpts from a letter from Charlie Dean of Oakland, California. Mr. Dean says he has been attempting to raise ducks on a small scale at his ranch, but has been prevented from doing so because of the bluejays' egg-breaking activities.

"I built a pond and installed several mallard ducks," Mr. Dean writes. "For several years it has been impossible for me to raise any young ducks in the enclosure due to the fact that the bluejays break the eggs nearly as fast as they are laid, even going into the small structure I put in for nesting purposes. By systematic watchfulness I can save a few eggs for setting under a hen, but the mother ducks haven't a chance of raising a brood unless they can get away outside and hide their nests."

Two Billions Yearly

Two billion dollars just about covers the damage done by insect pests in this country each year, according to Lee A. Strong, Chief of the Bureau of Entomology and Plant Quarantine, United States Department of Agriculture. This sum is estimated from the known amount—about $900,000,000—of the damage done annually by 34 of the more important insect pests. For example, the boll weevil exacts an average yearly toll of $164,000,000, and the corn ear worm, which attacks cotton and tomatoes as well as corn, a toll of $104,000,000.

The world has more than 700,000 kinds of insects that have been named and described, and new ones turn up every now and then. In North America there are 50,000 kinds of insects—6,500 being consistently destructive year after year.

No one region is specially subject to insect infestation, nor is one region likely to be the heaviest sufferer in successive years. Sometimes insect pests are worse in the Cotton Belt; at other times in the Grain Belt. Naturally, they are most costly in regions where crop values are high.

Sterile Trees Made to Bear

Back-yard fruit growers who have only one or two trees of each kind frequently have trouble getting them to bear, even when there is a good crop of blossoms, say fruit specialists in the United States Department of Agriculture.

Blossoms of certain common fruit varieties must be cross-pollinated. They are self-sterile, and depend upon pollen—usually brought by bees—from nearby trees of other varieties.

A small home orchard should be planted to varieties that fertilize themselves, or, if they are self-sterile, two or more varieties of the same species may be planted. Where self-sterile trees already are established, a permanent remedy is to top-work a few of the limbs to varieties that bloom at the same time as the rest of the tree. The best time for top-working fruit trees is just as growth starts in the spring.

A temporary measure is to place a limb of a different variety—blooming at the same time as the tree to be pollinated—in the top of the self-sterile tree. Bees will visit the blossoms of this limb and pollinate the sterile flowers. Branches cut from one tree and placed in another retain their freshness for several days if the cut ends are placed in water.

County agricultural agents and State colleges of agriculture can supply lists of varieties adapted to any locality.

Penguin Habitat Group

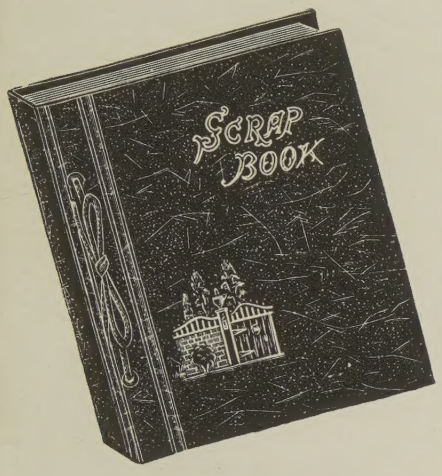
A habitat group of the rare emperor penguin, composed of specimens collected by Admiral Richard E. Byrd on his last expedition to the Antarctic, is on view at the Field Museum of Natural History, Chicago. The birds are the largest and rarest of all penguins and are found only near the South Pole where the average temperature is 50 degrees below zero. The group represents an innovation in ornithological taxidermy because of the application of various new methods used for the first time in the preparation of these specimens.

When is the best time to Plant?
Will it grow best in sun or shade?
What soil does this plant like?
How do I combat this plant disease?
WHERE DID I READ THAT?

How often have you wanted some information on garden subjects and couldn't locate it at the time most needed.—Of course you read about the very thing you had in mind and you fully intended to clip the article out and save it for future reference.—You either misplaced the clipping or entirely failed to save the information for lack of a convenient place to keep it.

Garden Scrap Books

Will solve your problem. These books have been especially made for people who take a keen interest in their gardens, flowers, shrubbery, etc. But they may be used for preserving other data as well.



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The River Pasture

This is the title of a new book by the new writer, Judy Van der Veer. According to the publishers she is "the four-leaf clover among writers that publishers are always searching for and so rarely find." They are right. Miss Van der Veer lives on a ranch in the mountains of southern California. More than that, she loves the ranch and all the things that roam and crawl about upon it, or grow in its soil. And, what is more, she possesses that rare and elusive faculty of understanding them. Finally she has the ability to write about them directly and sincerely, finding the right word for the right incident. The book is informal in subject and style. The chapters are short and long, varied and delightful. We are inclined to agree with Longmans, Green and Company, who publish this book and modestly ask two dollars for it, that Judy "is a real discovery."

Autumn Twilight

By Dorothy Jane Wentling
Age 12

I was walking home the other night at sunset. As I was not in any hurry, I took time to notice how beautiful the hills and forests looked against the orange west. Autumn was well under way, and though it had not yet snowed, it was very cold. I was warmly dressed, nevertheless I shivered a little. To my right stretched away the fields of corn and pumpkins, which even the beautiful mystery of an autumn sunset could not improve, for they were a bare sight indeed, those corn shocks and shorn plots silhouetted against the sky. To my left, the forest-covered hill and valley as far as I could see in the quickly gathering dusk. One does not really appreciate the mystery of twilight unless one can notice the lengthening shadows and the fading sky. It was pretty dark by now, and far off down the valley, and on the hillside, the lighted farmhouse twinkled pleasantly. With the setting of the sun, all possible warmth seemed to go out of the air, and drawing my coat more tightly around me, I hurried my steps so as to reach home as quickly as I could.

Gaining the crest of a little knoll, I looked again at the fast fading west. Silhouetted thus against the pale orange I saw a flock of wild geese flying in a V toward the south. I stood still and watched them until they were swallowed up in the dusk of the oncoming night. Wondering why it is that so many people dread Autumn, I too turned south.

A Use for Centipede Grass

Miracles in soil chemicalization are being performed at Fort Pulaski National Monument, on historic Cockspur Island, Ga., where the old parade ground is being transformed by the use of "centipede grass." The earth on this low-lying island, with its salt marshes, is being sweetened through the plantings of this grass, which spreads rapidly and seems able to perform in six months' time a re-chemicalization that ordinarily requires several years. The improvement in the appearance of the grounds is favorably commented upon by the hundreds of visitors who make the picturesque old fort, at the mouth of the Savannah River, their week-end mecca.

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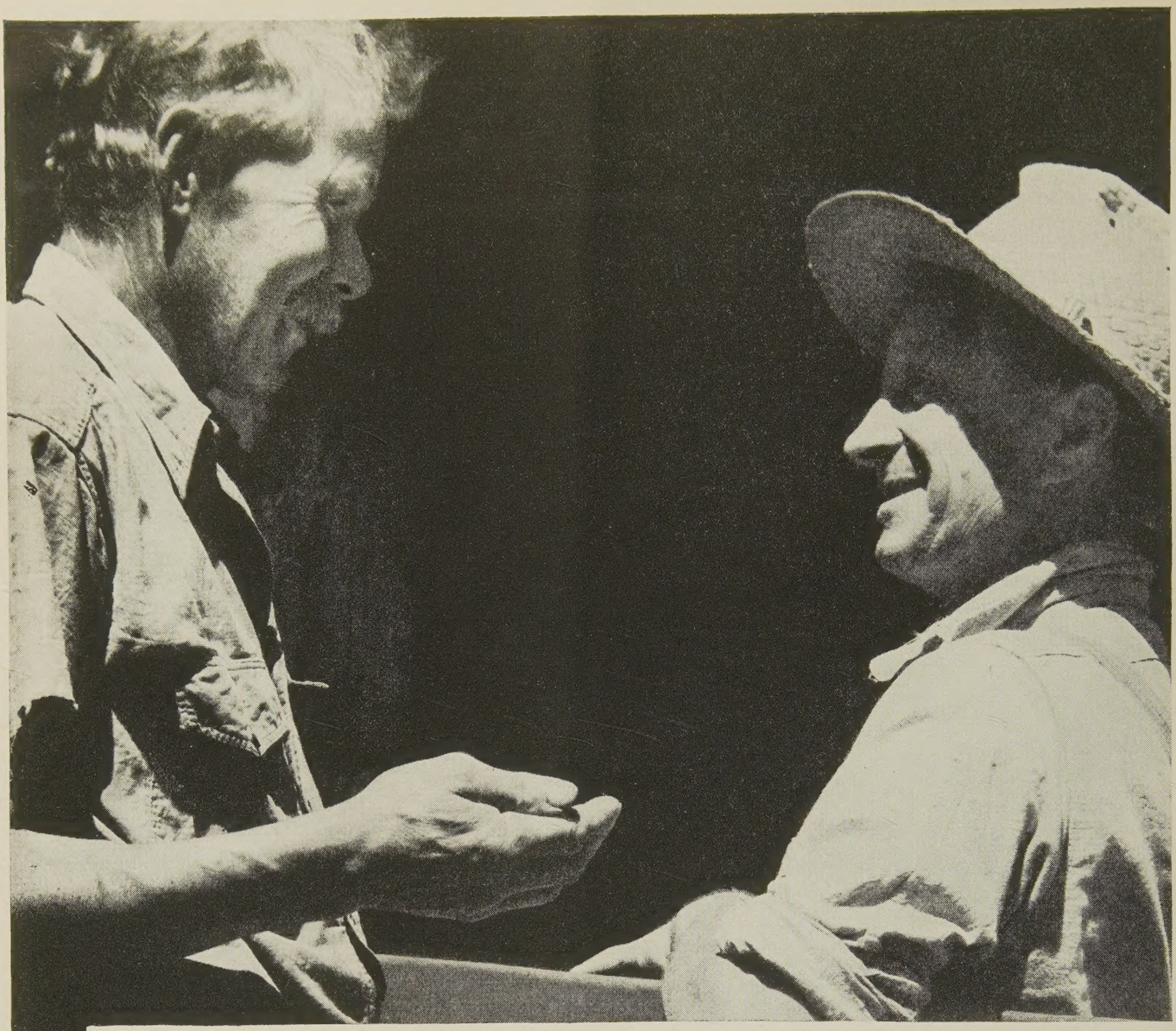

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THIS COUNTRY has the best telephone service in the world. And it's still getting better—quicker, clearer, more useful to more people. Each year brings improvements in equipment and operating efficiency. Operating errors on local calls—always a small percentage of the millions handled daily—have decreased 40% in the past six years.

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Time has proved the value of the Bell System plan of operation—"One policy, one system and universal service."

BELL TELEPHONE SYSTEM

In September, Maurice Thompson

"So AUGUST quietly drifted by, and September hung its yellow banner on the corn and said farewell with a sigh that had in it a smack of winter," Maurice Thompson wrote in a transitional paragraph of a "Legend of Potato Creek," one of the well-flavored yarns in *Hoosier Mosaics*. Elsewhere in this small book of Indiana character stories, Thompson describes "a ripe sweet day in the latter part of September—clear, but hazy and dreamful—a prelude to the Indian summer." In his best-known *Alice of Old Vincennes,* the same writer tells of "a week of dreamy autumn weather", when the two lovers of the tale sat often together "where the fading vine leaves made fairy whisperings, and where the tempered breeze blew deliciously cool from over the distant multi-colored woods."

Born on September 9, in 1844, James Maurice Thompson was among the generation of American writers that gave particular attention to Nature, and his experience was one of wide latitude. After spending the early years of his life in Indiana, Missouri, and Kentucky and his boyhood and youth in Georgia (the Coosawattee Valley) and afield in the Confederate service, he returned to Indiana and there settled, in Crawfordsville. He had come as a civil engineer on a railroad, but he stayed as the husband of Alice Lee, his employer's daughter, and one senses the background and atmosphere of this romance in the story called "Hoiden" in *Hoosier Mosaics.* As lawyer, legislator, State geologist, and finally as author he made Indiana his home until his death, on February 15, 1901. But there were many winter trips to the South, and his life and writings were of a man of at least two latitudes.

Between *Hoosier Mosaics,* his first book, published in 1875, and *Alice of Old Vincennes,* which crowned his writings with a great popularity upon its publication in 1900, there were other works of fiction; but sprinkled among them—even as his stories are freshened by constant recollections of the out-of-doors—are two books of poems, three volumes of essays largely on Nature, and writings on archery and other outdoor sports. The poetry —*Songs of Fair Weather* (1883) and *Poems* (1892)— is lyric and inspired for the most part by influences outside of buildings and libraries. The three volumes of essays—*By-Ways and Bird Notes* (1885), *Sylvan Secrets, in Bird-Songs and Books* (1887), and *My Winter Garden: A Nature-Lover Under Southern Skies* (1900)— contain as charming and stimulating reading as one might wish for on a cool September evening, and his work on *The Witchery of Archery* (1878) makes it seem to at least one reader that the witchery of this sport which Thompson and his brother popularized came not from the bow and arrow but rather from scenes and experiences along the way.

But it is the "trilogy" on Nature—*By-Ways and Bird Notes, Sylvan Secrets,* and *My Winter Garden*—that will have the greatest appeal to many readers, and though these books do not deal particularly with September phenomena, they are for the most part written without great regard to seasons and are accordingly good evening companions in any month. Like the migratory birds, Thompson went south before the coming of winter, and his books are thus without the sharp contrasts of this season, his "winter garden" being without snow but a place of sunshine. In what seems to be a rare reference to September, he writes in *My Winter Garden* that he had seen rose-breasted grosbeaks "migrating southward in scattering flocks during the last days of August and the first week of September", and in *Sylvan Secrets* he writes a chapter on "Mind, Memory and Migration of Birds."

In the mind of a recent reader, however, three Nature subjects in Thompson's books stand out prominent, and all are of interest in September—woodpeckers, kingfishers, and mockingbirds. In a chapter on "Some Hyoid Hints" in *Sylvan Secrets* he discusses with charm and interest the marvellous tongue of the woodpeckers, and in *By-Ways and Bird Notes* he writes on "A Red-headed Family," an essay flavored with southern dialect and southern experiences with the ivory-billed woodpecker. In one of the "Tangle-Leaf Papers" in the same book he admires the marvellous adaptations of the Kingfisher, and in *Sylvan Secrets* he includes a chapter on "Ceryle Alcyon", one of Thompson's best essays, meaty with observations and experiences and references to the bird's place in literature and superstition.

It is, however, the mockingbird that seems to charm Thompson the most and of which he writes in all of these three books, and with these writings of the mockingbird are frequent references to Buffon—George Louis Leclerc Buffon, who also was born in September, on the seventh, in 1707, and wrote the famous "L'Histoire Naturelle". In *My Winter Garden* Thompson writes at length of Buffon. Buffon, he says, knew how "to give the fragrance of fresh discovery to nearly everything"; he praises the Frenchman's chapter on the kingfisher as "another inimitable piece of writing"; but of the mockingbird he says: "It was a long way from Buffon's study in his garden at Monbart to a Carolina thorn-bush or haw-tree in which the *moqueur* was singing: but the great naturalist's genius had command of the range; his imagination grasped almost every detail of the performance, even to a strong hint of the rare dropping-song."

Many bright passages in Thompson's writings persist in memory, but one stands out with a special significance. "Everything," he wrote, "is suggestive. To the vision of a careful observer and student each object in Nature has an interrogation-point beside it. With pencil and note-book let us catalogue these suggestions and interrogations, and lay them aside for future use. When, some day, we come to look them over we shall be surprised how perfectly— like dried roots and plants—they have kept their outdoor fragrance and taste."

HOWARD ZAHNISER.

"IN THAT RADIANCE THE GREAT STAG LOOKED LARGER THAN NATURAL"